OCTOBER 1911.] [Price 6s.

PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.

123RD SESSION.

FROM NOVEMBER 1910 TO JUNE 1911.

LONDON:
PRINTED FOR THE LINNEAN SOCIETY,
BURLINGTON HOUSE, PICCADILLY, W.
BY TAYLOR AND FRANCIS, RED LION COURT, FLEET STREET.

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Publications of the Society issued during the period, 31st July, 1910, to 31st July, 1911 :—

Journal (Botany), No. 272, 18th Oct., 1910.
,, (Zoology), No. 202, 20th Oct., 1910.
,, 211, 20th July, 1910.

Transactions (2nd Ser.) Botany, Vol. VII. Part xv., Oct. 1910.
,, (2nd Ser.) Zoology, Vol. X. Part x., June 1911.
Vol. XI. ,, vi., Dec. 1910.
,, vii., Dec. 1910.
Vol. XIII. ,, iv., Nov. 1910.
Vol. XIV. ,, i., Nov. 1910.

Proceedings, 122nd Session, from November 1909 to June 1910 : October 1910.

List of [Fellows, Associates, and Foreign Members], 1910–1911.

PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.

(ONE HUNDRED AND TWENTY-THIRD SESSION, 1910–1911.)

November 3rd, 1910.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 16th June, 1910, were read and confirmed.

Mr. Hugh Broughton was admitted a Fellow.

Mr. Anthony Belt and Prof. Edward Alfred Minchin, M.A. (Oxon.), were elected Fellows.

Miss Madelaine Carson, M.Sc., Mr. Jules Augustin de Gaye, Mr. Thomas Bennett Goodall, F.R.C.V.S., Mr. Francis Cecil Hudson, Mr. Norman Miller Johnson, Miss Eleanor Mary Evered Parsons, Lieut.-Col. Simpson Powell, M.D. (Durh.), and Mr. Harold Stuart Thompson, were proposed as Fellows.

The following letter addressed to the General Secretary was read from the Chair:—

Marlborough House,
Pall Mall, S.W.,
18*th July*, 1910.

Dear Sir,

I am commanded by The King to inform you that His Majesty is graciously pleased to become Patron of the Linnean Society of London.

Yours faithfully,
(Signed) W. H. P. CARINGTON,

The deaths of Dr. Melchior Treub, Foreign Member, of Samuel Alexander Stewart and Edward Gerrard, Associates, were announced.

The following papers were read and discussed :—

1. Prof. W. A. Herdman, F.R.S., F.L.S.—A Comparison of the Summer Plankton on the West Coast of Scotland with that in the Irish Sea.
2. Mr. J. C. F. Fryer.—The Structure and Formation of Aldabra and neighbouring Islands, with notes on their Flora and Fauna. (Communicated by Prof. J. Stanley Gardiner, F.R.S., F.L.S.)
3. Mr. H. B. Bigelow.—On the Siphonophora of the 'Research' Biscayan Plankton. (Communicated by Dr. G. Herbert Fowler, F.L.S.)

November 17th, 1910.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 3rd November, 1910, were read and confirmed.

Dr. Edward Hindle and Mr. Cuthbert St. John Nevill were elected Fellows.

The Rev. Manoah Holland and Mr. Hugh Godfrey Mundy were proposed as Fellows, and Mr. Arthur Bennett and Mr. William Cole were proposed as Associates.

Mr. W. C. Worsdell, F.L.S., exhibited specimens of Maize showing androgynous inflorescences, from Pretoria, South Africa; Dr. Stapf spoke on the probable derivation of *Zea Mays* from a species of *Euchlæna*. Mr. Worsdell also showed the model of a native tortoise carved from some unknown wood, which had been riddled by a wood-boring beetle in Cape Town, identified as *Botrychoplites cornutus*, Oliv.

Prof. J. W. H Trail, F.R.S., F.L.S., exhibited specimens and a lantern-slide of a remarkable form of *Rubus Idæus*, distributed over a considerable district in Aberdeenshire, in which the normal number of leaflets was increased by an extra basal pair, approaching the leaf of the Suberecti group of fruticose *Rubi*.

A discussion followed in which Prof. Henslow, Mr. Henry Groves, and the President took part.

The General Secretary showed a monstrous pear, similar to those figured by Dr. Masters in his 'Vegetable Teratology,' which had been picked up under a pear-tree in a Holloway garden by Mr. A. H. Williams. Prof. Henslow and Mr. Worsdell remarked upon the frequency of this monstrosity and its probable origin.

The following papers were read and discussed :—

1. Prof. G. Henslow, F.L.S.—A Theoretical Origin of *Plantago maritima*, L. and *P. alpina*, L. from *P. Coronopus*, L. Vars.
2. —— A Theoretical Origin of Monocotyledons from Aquatic Dicotyledons, through Self-Adaptation to an Aquatic Habit—Being Supplementary Observations to a previous paper (Journ. Linn. Soc., Bot. xxix. (1892) p. 485).

December 1st, 1910.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 17th November, 1910, were read and confirmed.

Miss Ida Margaret Hayward and Mr. Cuthbert St. John Nevill, were admitted Fellows.

Miss Madelaine Carson, M.Sc., Mr. Jules Augustin de Gaye, Mr. Thomas Bennett Goodall, F.R.C.V.S., Mr. Francis Cecil Hudson, Mr. Norman Miller Johnson, Miss Eleanor Mary Evered Parsons, Lieut.-Col. Simpson Powell, M.D. (Durh.), and Mr. Harold Stuart Thompson, were elected Fellows.

Mr. G. Claridge Druce exhibited *Utricularia ochroleuca*, Hartm., and *U. Bremii*, Heer, new records from Ireland, with *Arabis alpina*, Linn., and *Chærophyllum aureum*, Linn., from Scotland, the latter two in confirmation of George Don's statements, which had been doubted during the last century.

A discussion followed, the participants being Mr. Clement Reid, Mr. E. M. Holmes, and Mr. Henry Groves, Mr. Druce briefly replying.

Miss Ida M. Hayward exhibited 18 alien plants selected from about 200, which had been noted by the side of the river Tweed, and its tributary the Gala. (See p. 48.)

The following paper was read and discussed :—

Capt. C. F. U. Meek, F.L.S.—The Spermatogenesis of *Stenobothrus viridulus*, with special reference to the Heterotropic Chromosome as a sex determinant in Grasshoppers.

December 15th, 1910.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 1st December, 1910, were read and confirmed.

Prof. William Bateson, M.A., F.R.S., Miss Madelaine Carson, Miss Eleanor Mary Evered Parsons, and Mr. Henry Smith Holden, B.Sc., were admitted Fellows.

The Rev. Manoah Holland and Mr. Hugh Godfrey Mundy were elected Fellows; and Mr. Arthur Bennett and Mr. William Cole were elected Associates.

Miss Beatrice O. Corfe exhibited a portfolio of drawings in water-colour, natural size, of about 250 wild flowers, chiefly from the neighbourhood of Winchester. For some years she had studied flowers as an artist and lover of Nature, to whom plant-growth and blossom had a great attraction from the variety of form and colour displayed.

Additional observations were contributed by the President, Mr. H. J. Elwes, Mr. E. M. Holmes, Prof. Dendy, Mr. J. C. Shenstone, and the Rev. T. R. R. Stebbing, expressive of admiration for these successful representations of the natural forms and colours of the native flora, and a preference for an artistic rather than a photographic record of plant-life.

Dr. Stapf then brought forward the reports on the International Congress of Botanists at Brussels (see p. 51).

Dr. Stapf having concluded, an animated discussion followed, in which the following engaged:—The President, Prof. Dendy, Mr. H. J. Elwes, Mr. Augustin Henry, the General Secretary, Mr. H. N. Dixon, and the Rev. T. R. R. Stebbing; Dr. Stapf briefly replying.

The following papers were read and discussed:—

1. Mr. R. W. H. Row, B.Sc., F.L.S.—Non-calcareous Sponges from the Red Sea, collected by Mr. Cyril Crossland, F.L.S.
2. Mr. R. S. Adamson.—Notes on the Comparative Anatomy of the Leaves of certain Species of *Veronica*. (Communicated by Mr. A. G. Tansley, F.L.S.)

January 19th, 1911.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 15th December, 1910, were read and confirmed.

The Rev. Manoah Holland and Prof. Edward Alfred Minchin, M.A., were admitted Fellows.

The President alluded to the great loss biological science has sustained in the death of Sir Francis Galton, F.R.S., on the previous day, and stated that although not a Fellow of the Society, he had often been at our Meetings, and was closely associated with us as one of the recipients of the Darwin-Wallace Medal on the 1st July, 1908.

Miss Beatrice O. Corfe exhibited some trays of Lepidoptera and other insects received from her brother, Mr. Charles Corfe, living at Toronto. Amongst these local insects were some equally common in Great Britain and Canada, as the Red Admiral (*Vanessa Atalanta*) and a local variety of the Large Tortoiseshell (*V. polychloros*). Others, as the Camberwell Beauty, *Vanessa Antiopa*, common in Canada, are extremely rare in the United Kingdom, and still others, as many of the various Swallowtails, are absent from our fauna. Many of these insects were caught at the street lamps.

Prof. Dendy and Mr. G. E. Nicholls exhibited a series of lantern-slides illustrating the structure and relations of the Sub-Commissural Organ and Reissner's Fibre in various vertebrate types; the slides were described by Prof. Dendy, and Mr. Nicholls gave a brief account of some experiments which he had made which so far seemed to support the view that these organs constitute an apparatus for automatically regulating the flexure of the long axis of the body.

Mr. F. N. Williams, Dr. Rendle, Prof. Minchin, and Dr. Lilian Veley discussed the points raised by the exhibition, and Prof. Dendy replied.

The Rev. R. A. Bullen exhibited specimens of *Bythinella padiraci*, Locard, and *Niphargus plateaui*, Chevreux, from an underground river in Southern Central France. The Rev. T. R. R. Stebbing added some observations to the foregoing.

The following papers were read and discussed:—

1. Mr. C. H. Wright, A.L.S.—The Flora of the Falkland Islands.

2. Mr. Cyril Crossland, F.L.S.—A Physical Description of Khor Dongonab, Red Sea.
3. Mr. Rowland E. Turner.—On the Fossorial Hymenoptera of the Indian Ocean. (Communicated by Prof. J. Stanley Gardiner, F.R.S., F.L.S., with the four following.)
4. Prof. J. J. Kieffer.—The Cecidomyiidæ of the Seychelles.
5. —— The Chironomidæ of the Seychelles.
6. Dr. K. Kertész.—The Stratiomyiidæ of the Seychelles.
7. Mr. E. Meyrick, F.R.S.—The Tortricina and Tineina of the Seychelles and Aldabra.

February 2nd, 1911.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 19th January, 1911, were read and confirmed.

The General Secretary showed a series of lantern-slides, (1) explaining the genesis of the portrait of Carl von Linné, painted by Alexander Roslin, and the various copies, including the original three-quarter-length portrait now at Versailles, though in a somewhat poor condition; and (2) showing that the Lapland drum in the Hoffman portrait and on the lap of the foreground figure in the engraved title-page of the 'Flora lapponica' is a magic drum, and not a botanic press. (See abstract on pp. 56–61.)

Dr. Young asked a question about the reversal of the Bervic print, to which Dr. Daydon Jackson replied.

Dr. Otto Stapf, F.R.S., Sec.L.S., showed specimens and a lantern-slide of *Digitaria didactyla*, Willd., from Sydney, where it has recently been used with fair success in making lawns.

Mr. A. W. Sutton, F.L.S., stated:—"It is almost a universal custom throughout the Continent—that is, in France, Germany, Switzerland, and Italy—to make their garden lawns fresh every year by sowing Perennial Rye Grass (*Lolium perenne*) exclusively, or almost exclusively, as, owing to the heat and drought often experienced, it is impossible to use those finer grasses in mixture which are the essential feature of English lawns. Consequently the *Digitaria didactyla* exhibited may prove of greater value on the Continent than in England."

Rev. T. R. R. Stebbing asked what gave the green colour in the spring in the Nile Valley, when Mr. Sutton replied that it was wholly due to young corn, along the river-side and canals.

The following papers were read and discussed:—

1. Fleet-Surgeon Matthew, M.B., F.L.S.—Enumeration of Chinese Ferns.
2. Mr. S. T. Dunn, F.L.S., showed a series of lantern-slides from photographic snap-shots during his journey in Central Fokien, described on the 6th February, 1908, before this Society. He also showed some specimens of bamboo-rope, the species of which had not yet been identified, used on the rivers of that province, which he had procured for the Museum at Kew.
3. —— Supplementary List of Chinese Flowering-Plants, in continuation of the List in the Society's Journal (Botany), vol. xxxvi., and extending from 1904 to 1910.
4. Mr. W. Rickatson Dykes (a visitor) showed a series of autochrome photographs on the screen of various Indian and Chinese species of *Iris* in his garden.
5. Mr. S. T. Dunn, F.L.S.—A Revision of the Genus *Actinidia*, Lindl.

February 16th, 1911.

H. W. Monckton, Esq., Treasurer & V.-P., in the Chair.

The Minutes of the General Meeting of the 2nd February, 1911, were read and confirmed.

Miss Freda Bage, M.Sc., Mr. Ralph Evelyn Drake-Brockman, M.R.C.S., L.R.C.P., Mr. Moore Betty Fullerton, and Mr. Charles David Soar, F.R.M.S., were proposed as Fellows.

The Vice-President announced from the Chair that there were now seven vacancies in the List of Foreign Members.

Prof. Dendy, F.R.S., Sec.L.S., showed three lantern-slides of some remarkable growth-forms in sponges, and exhibited a singular horny sponge collected by him in New Zealand, which has not yet been described.

The Rev. T. R. R. Stebbing referred to some curious sponges in a collection possessed by him, and Prof. Dendy replied.

The following papers were read and discussed:—

1. Mrs. L. J. Wilsmore.—On some Hexactiniæ from New South Wales. (Communicated by Prof. J. P. Hill, F.L.S.)
2. Rev. Canon Norman, F.R.S., F.L.S.—Three Species of Harpactid Copepoda.

3. Mr. A. S. Hirst.—Report on the Araneæ, Opiliones, and Pseudoscorpiones from the Seychelles. (Communicated, with two following, by Prof. J. Stanley Gardiner, F.R.S., F.L.S.)
4. Mr. G. A. Boulenger, F.R.S.—List of the Batrachians and Reptiles obtained by Prof. Stanley Gardiner on his Second Expedition to the Seychelles and Aldabra.
5. Miss Mary Jane Rathbun.—On the Marine Brachyura from the Indian Ocean collected in 1905.

March 2nd, 1911.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 16th February, 1911, were read and confirmed.

Mr. George Herbert Wailes was proposed as a Fellow, and Dr. Hans Driesch, Prof. Richard von Hertwig, Geh.-Hofrat Prof. Georg Klebs, Prof. Sergej Gawrilowitsch Nawaschin, Dr. Eugène Penard, Prof. Johann Wilhelm Spengel, and Prof. Edmund Beecher Wilson as Foreign Members.

Mr. C. E. Salmon showed British specimens of *Lepidium neglectum*, Thell., and *L. densiflorum*, Schrad. Mr. F. N. Williams, Mr. E. G. Baker, and Dr. O. Stapf discussed the probable origin of these forms, and Mr. Salmon replied.

Mr. E. M. Holmes showed a specimen of *Griffithsia globifera*, J. Ag., from Milford Haven; Mr. Cotton remarked upon the spread of some of these alien algæ in our waters.

Mr. H. W. Monckton, Treas. & V.-P., showed a series of lantern-slides from photographs taken during his visit last autumn to Sweden as a delegate on behalf of the Society to the International Congress of Geologists, especially those taken at Uppsala, some of which showed places connected with Carl von Linné, including a front view of his house in the old Botanic Garden.

Mr. H. R. Darlington commented on the modern use in Sweden of the German prefix "von."

The General Secretary then showed a supplementary series of lantern-slides, chiefly from old prints, concerning the history of the old botanic garden. He stated that when Linné and Rosén had exchanged Chairs in January 1742, and the former had thereby become prefect of the garden, he took immediate steps to rearrange the garden, provide glass-houses, and rebuild the house attached, which belonged to the prefect. The last slide showed the old poplar close to the entrance, the only specimen which can be regarded as coeval with Linné, inasmuch as the laurels and a few other veterans had been transported to the new botanic garden early in the nineteenth century.

Dr. A. Strahan, F.R.S. (visitor), Mr. H. N. Dixon, Dr. A. P. Young, and Dr. James Murie joined in the discussion which ensued upon the whole exhibition.

Mr. John Hopkinson then showed thirty slides taken about the same time as those of his co-delegate, but from a different line of country; he also showed specimens of rock from Omberg and Kinnekulle.

The General Secretary alluded to the profile of Kinnekulle, published by Linné in his 'Wästgöta resa' in 1747, and specially alluded to by Prof. A. G. Nathorst in his 'Linné såsom geolog' which came out in 1907.

The following papers were read and discussed:—

1. Dr. Malcolm Burr, F.L.S.—Dermaptera (Earwigs) preserved in Amber.
2. Miss Laura Roscoe Thornely.—Report on the Marine Polyzoa of the Collection made by Mr. J. Stanley Gardiner, in the Indian Ocean, in H.M.S. 'Sealark' during 1905. (Communicated by Prof. J. S. Gardiner, F.R.S., F.L.S.)
3. Rev. T. R. R. Stebbing, F.R.S., F.L.S.—The terms Polyzoa and Bryozoa. (See Abstract, p. 61.)
4. Mr. W. M. Tattersall.—On the Nysidacea and Euphausiacea collected in the Indian Ocean during 1905. (Communicated by Prof. J. Stanley Gardiner, F.R.S., F.L.S.)

March 16th, 1911.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 2nd March, 1911, were read and confirmed.

Mr. Anthony Belt and Dr. Edward Hindle were admitted Fellows.

Miss Freda Bage, M.Sc., Mr. Ralph Evelyn Drake-Brockman, M.R.C.S., L.R.C.P., Mr. Moore Betty Fullerton, and Mr. Charles David Soar, F.R.M.S., were elected Fellows.

Prof. A. Dendy, F.R.S., Sec.L.S., read a communication from Prof. W. A. Herdman, F.R.S., combating the statement regarding the use of the term "Polyzoa" made by the Rev. T. R. R. Stebbing at the last meeting; on the suggestion of Mr. Stebbing the discussion was postponed to another Meeting. (See Abstract, p. 62.)

Mrs. D. H. Scott gave a lantern exhibition of new species of the fossil genus *Traquairia*. She also exhibited the original diagram made by Dr. W. Carruthers, F.R.S., who first described the genus at a meeting of the British Association in 1872, in a paper entitled "*Traquairia*, a Radiolarian Rhizopod from the Coal-Measures."

Count Solms-Laubach, Professors Schenk, Strassburger, and Zeiller, considered it comparable to the massulæ or sporocarps of *Azolla*. Prof. Williamson (Phil. Trans. 1880) thought it the spore of a Cryptogam. He found a group of three *Traquairiæ* in a sporangium of *Lepidostrobus*, and thought them three megaspores of a tetrad. The true megaspores are, however, now well known.

Mrs. Scott defined *Traquairia* thus:—"*Traquairia* is a spherical organism, consisting of two parts each surrounded by a sharply defined membrane—an inner capsule, often containing spores, and an outer part, which is surrounded by a thick gelatinous envelope. In this are embedded numerous hollow spines. The apparent bases of these spines are produced into hollow anastomosing tubes, which spread over the surface of the sphere, forming a complicated network. The spines are hollow and are perforated in every direction by projecting tubular pores. Emanating from these pores are delicate threads which appear to lose themselves in the gelatinous envelope. Sometimes the threads form a regular network in it. The inner capsule, a definite brown membrane, can only be observed in the more perfectly preserved specimens. Spores are generally present, which appear to produce small spores. *Traquairiæ* occur in groups in the decayed wood of *Lepidodendron* and other plants."

She then exhibited *T. Carruthersii*, *T. Spenceri*, sp. nov., *T. burntislandica*, sp. nov., and *T. stellata*, sp. nov., and a species of an allied genus, *Sporocarpon elegans*. The most characteristic feature in the organisms described is the very complicated structure of the outer envelope with its elaborate system of anastomosing tubes connected with prominent spines, which are themselves very complex organs. Nothing parallel to this is known in the vegetable world.

The presence of an "inner capsule" containing spores, in the interior of which small spores are produced, is reminiscent of Radiolarians. These features are also common to *Sporocarpon elegans*, which with its long spines is very much like a Radiolarian.

A discussion followed in which Dr. G. J. Hinde, F.R.S. (visitor), Prof. Dendy, Rev. T. R. R. Stebbing, Prof. F. W. Oliver, and the President took part.

The following paper was read and discussed:—

Mr. R. S. Adamson, M.A.—An Ecological Study of a Cambridgeshire Woodland. (Communicated by Mr. A. G. Tansley, F.L.S.)

April 6th, 1911.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 16th March, 1911, were read and confirmed.

Mr. Norman Miller Johnson and Mr. Moore Betty Fullerton were admitted Fellows.

Mr. George Herbert Wailes was elected a Fellow.

The Rev. Hilderic Friend, Miss Ann Cronin Halket, Mr. Ernest Lee, A.R.C.S., Mr. John Coney Moulton, Mr. Frederick John Freshwater Shaw, B.Sc., and Mr. Malcolm Wilson, B.Sc., were proposed as Fellows.

The following Auditors were recommended by the Council, and were, by show of hands, elected:—For the Council, Prof. Dendy and Dr. A. B. Rendle; for the Fellows, Mr. Henry Groves and Mr. Hamilton Druce.

The President announced that the Council had selected Count Hermann zu Solms-Laubach to receive the Linnean Medal.

The following papers were read and discussed:—

1. Miss Sarah M. Baker, B.Sc.—On the Brown Seaweeds of the Salt-Marsh. (Communicated by Prof. F. W. Oliver, F.R.S., F.L.S.)
2. Dr. C. E. Moss, Mr. E. G. Salisbury, F.L.S., and Dr. Ethel de Fraine, F.L.S.—On the Genus *Salicornia*; its History, Character, and Anatomy.

May 4th, 1911.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair, afterwards Prof. Poulton, F.R.S., V.-P.

The Minutes of the General Meeting of the 6th April, 1911, were read and confirmed.

Mr. Jules Augustin de Gaye and Mr. Charles David Soar were admitted Fellows.

Mr. Frederick Eyles, Mr. John Graham Murray, and Mr. Charles Waterfall were proposed as Fellows.

Dr. Hans Driesch, Prof. Richard von Hertwig, Geh.-Hofrat Prof. Georg Klebs, Prof. Sergej Gawrilowitsch Nawaschin, Dr. Eugène Penard, Prof. Johann Wilhelm Spengel, and Prof. Edmund Beecher Wilson, were elected Foreign Members.

The following papers were read and discussed:—

1. The Rev. T. R. R. Stebbing, F.R.S., F.L.S.—On John Vaughan Thompson and his Polyzoa, and on *Vaunthompsonia*, a genus of Sympoda. (See Abstract, p. 64.)
2. Prof. Sydney J. Hickson, F.R.S.—On *Polytrema* and some allied genera. (Communicated by Prof. J. Stanley Gardiner, F.R.S., F.L.S.)
3. Mr. J. M. Brown, B.Sc., F.L.S.—Observations on some new and little-known British Rhizopods.
4. Mr. R. Shelford, F.L.S.—The British Museum collection of Blattidæ enclosed in Amber.
5. Dr. F. E. Fritsch, F.L.S.—Freshwater Algæ collected in the South Orkneys by Mr. R. N. R. Brown.

May 24th, 1911.

Anniversary Meeting.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 4th May were read and confirmed.

Mr. William Neilson Jones, M.A. (Cantab.), was proposed as a Fellow.

The Treasurer then laid his Annual Statement of Accounts before the Meeting, which, after observations by Mr. Alfred W. Oke, Sir Frank Crisp, Lt.-Col. Prain, and Mr. John Hopkinson, was received and adopted (see pp. 14 & 15).

The General Secretary laid his Annual Report before the Meeting, thus:—

Since the last Anniversary 15 Fellows had died, or their deaths been ascertained, viz.:—

Fellows (15).

Thomas Hodgson Archer-Hind.
Richard Henry Beddome.
James Bisset.
John Bennett Carruthers.
William Ambrose Clarke.
Thomas Walker Coffin.
Theodore Cooke.
Alfred Russell Fox.
John Hinchley Hart.
Frederick Hovenden.
Simpson Powell.
Harry Sanford-Burton.
Francis Lesiter Soper.
Robert Boog Watson.
William Dickenson Wickes.

Associates (2).

Edward Gerrard.	Samuel Alexander Stewart.

Foreign Members (2).

Melchior Treub.	Charles Otis Whitman.

Fellows withdrawn (9).

Charles Crossland.	Henry Aldwin Soames.
Louis Charles Deverell.	Ernest Ruthven Sykes.
Ernest John Lewis.	Charles Edward Walker.
Arthur Thomas Masterman.	Amandus H. C. Zietz.
Edward Archibald Smith.	

Whilst 25 Fellows, all of whom had qualified, 2 Associates, and 7 Foreign Members have been elected. One Fellow has, by election, been transferred to the list of Associates.

The Librarian's report was submitted as follows:—

During the past year there have been received as Donations from private individuals 87 volumes and 192 pamphlets.

From the various Universities, Academies, and Scientific Societies, there have been received in exchange and otherwise 319 volumes and 128 detached parts, besides 57 volumes and 29 parts obtained in exchange and as donations from the editors and proprietors of independent periodicals.

The Council at the recommendation of the Library Committee have sanctioned the purchase of 198 volumes and 81 parts of important books.

The total additions to the Library are therefore 661 volumes and 430 separate parts.

The number of books bound during the year is as follows:— In full-morocco 3, in half-morocco 234, in half-calf 4, in full-cloth 433, in vellum 88, in buckram 30, in boards and half-cloth 12. Relabelled (half-morocco and cloth back) 30. Total 834 volumes.

The General Secretary having read the Bye-Laws governing the elections, the President opened the business of the day, and the Fellows present proceeded to vote for the Council and Officers.

The Ballot for the Council having been closed, the President nominated Mr. Clement Reid, the Rev. T. R. R. Stebbing, and

Treasurer's Account for the Year ending April 30th, 1911.

(Presented at the Anniversary Meeting, May 24th, 1911.)

Receipts and Payments of the Linnean Society from May 1st, 1910, to April 30th, 1911.

Receipts.	£	s.	d.
Balance at Bankers on 1st May, 1910 ..... £218 16 4			
Less separate account 32 14 11			
	186	1	5
Interest on Investments	236	0	3
Admission Fees	162	0	0
Annual Contributions	1575	0	0
Compositions	75	0	0
Sales of Publications :—			
Transactions £139 15 7			
Journals 88 0 4			
Proceedings and Catalogues 2 17 9			
	230	13	8
Miscellaneous Receipts	9	4	6
Donations in aid of Publications	305	1	6
	£2779	1	4

Payments.	£	s.	d.
Taxes and Insurance	10	18	9
Repairs and Furniture	77	17	10
Coal, Electric Current and Gas	37	7	0
Salaries	784	10	6
Library :—			
Books £174 13 6			
Binding 123 7 9			
	298	1	3
Expenses of Publications :—			
Printing £550 18 0			
Illustrations 239 19 11			
Distribution 32 15 4			
	823	13	3
Miscellaneous Printing and Stationery	96	13	11
Petty Expenses (including Tea and Postage)	91	0	3
Linnean Medal	15	0	0
Investment of Compositions (£100 Midland 2½ Pref. Stock)	66	17	2
Balance at Bankers, 30th April, 1911 ..... £348 14 8			
Receipts not paid in 128 6 9			
	477	1	5
	£2779	1	4

Separate Funds Account.

	£	s.	d.		£	s.	d.
To Balance at Bankers, May 1st, 1910:—				By Trail Award		15	15	0
Westwood Fund £16 8 11				„ Purchase of £252 18s. 0d. Consols 2½ % on account of Sir F. Crisp's donation		200	0	0
Trail Fund 16 6 0				„ Balance at Bankers:—				
	32	14	11	Westwood Fund £23 8 3				
„ Donation from Sir F. Crisp for Special Award	200	0	0	Trail Award 4 1 0				
„ Interest on Investments:—				Crisp Award 2 19 6				
Westwood Fund £6 19 4					30	8	9	
Trail Award 3 10 0								
Crisp Award 2 19 6								
	13	8	10					
	£246	3	9		£246	3	9	

Investments on April 30th, 1911.

	£	s.	d.		£	s.	d.
Metropolitan 3½ per cent.	1079	11	3	@ 101	1090	7	2
Great Indian Peninsula Railway, Annuity Class B	42	1	5	@ 20¾	872	19	4
Forth Bridge Railway 4 per cent. Stock	450	0	0	@ 107	481	10	0
Metropolitan 3 per cent.	1000	0	0	@ 91	910	0	0
India 3 per cent	975	0	0	@ 83	809	5	0
Eastern Bengal Railway 4 per cent. Debenture Stock	1000	0	0	@ 106	1060	0	0
Great Western Railway 4 per cent. „ „	1000	0	0	@ 111	1110	0	0
Midland Railway 2½ per cent. Pref. Stock	300	0	0	@ 66¾	200	5	0
Metropolitan Water Board 3 per cent. Stock "B" (Westwood Fund)	232	5	0	@ 85½	198	11	6
New South Wales 3½ per cent. Stock (Trail Award Fund)	100	0	0	@ 98⅝	98	10	0
Consols 2½ per cent. (Crisp Award Fund)	252	18	0	@ 81¼	205	9	4
					£7036	17	4

HORACE W. MONCKTON, *Treasurer.*

We have (in conjunction with the Professional Auditor, who certifies as to all details) audited the Accounts of the Society for the year ended 30th April, 1911, and found the above statement correct. We call attention to the fact that receipts to the amount of £128 6s. 9d. have not been paid into the Bank, and the matter is the subject of investigation.

D. H. SCOTT, H. GROVES,
A. B. RENDLE, OTTO STAPF,
ARTHUR DENDY, HAMILTON H. DRUCE, } *Auditors.*

W. B. KEEN, *Chartered Accountant.*

Mr. A. O. Walker, Scrutineers, who, having cast up the votes, reported to the President, who declared the result as follows:—

Prof. V. H. Blackman, Sc.D.; Henry Bury, M.A.; Sir Frank Crisp; Prof. Arthur Dendy, D.Sc., F.R.S.; Prof. J. Stanley Gardiner, F.R.S.; E. S. Goodrich, F.R.S.; Henry Groves, Esq.; Prof. W. A. Herdman, F.R.S.; Arthur W. Hill, M.A.; Dr. B. Daydon Jackson; Horace W. Monckton, F.G.S.; Prof. Francis W. Oliver, F.R.S.; Prof. E. B. Poulton, F.R.S.; Dr. A. B. Rendle, F.R.S.; Dr. Walter George Ridewood; Miss Edith R. Saunders; Dr. Dukinfield H. Scott, F.R.S.; Dr. Otto Stapf, F.R.S.; Miss Ethel N. Thomas, B.Sc.; Dr. A. Smith Woodward, F.R.S.

The Ballot for the Officers having been closed, the President appointed Mr. Clement Reid, the Rev. T. R. R. Stebbing, and Prof. G. S. Boulger, Scrutineers, who, having cast up the votes, reported to the President, who declared the result as follows:—

President: Dr. Dukinfield Henry Scott, M.A., F.R.S.

Treasurer: Horace W. Monckton, F.G.S.

Secretaries: Dr. B. Daydon Jackson,
Prof. A. Dendy, D.Sc., F.R.S.,
Dr. Otto Stapf, F.R.S.

The President then delivered his Address:—

PRESIDENTIAL ADDRESS, 1911.

I HAVE lately had occasion to look into some of the older work on the structure of fossil plants, and it has occurred to me that a few notes on the subject might be of some general interest. The period referred to is that round about the year 1830—the period of Witham and Cotta and of the earlier work of Brongniart. It was an interesting time, when the study of fossil plants was first caught up in the flame of enthusiasm which then burnt so brightly for the young science of geology. It was practically a pre-evolution period, for though Lamarck had written, the influence of Cuvier was dominant; the evidence, however, was accumulating which ultimately formed the firmest basis of the theory of descent. In fossil botany in particular, the controversies which were soon to divide the French school from its neighbours had not yet sprung up, though Brongniart had already established his great and well merited authority in the science. If some of the opinions of that time strike us as crude and fantastic, we are just as often surprised at the greatness of the advance which had already been made and at the essential modernness of the point of view. Take the following, for example:—

"Everyone will readily admit that anatomical characters, those which relate to the intimate organisation of the plant, have more value than the external forms; it is to these characters, then, that one ought to attach the most importance when one is able to observe them; and when one cannot do so, one should seek to discover in the external form of organs, such modifications as may, so to speak, be the expression of the internal character, and may enable us to form an estimate of its modifications.

"The nutritive vessels, forming the framework which determines the relations of position and often even the form of organs, are evidently more important than the parenchyma which surrounds them, and which may mask the most essential character of an organ. The mode of distribution of the vessels alone may put us on the track of the true affinities of plants. Their arrangement is consequently the principal thing to observe in each organ."

This has a very modern sound. The passage might almost have been written yesterday; yet it is a literal translation from the Introduction to Brongniart's 'Histoire des Végétaux Fossiles' and was published in 1828. Evidently we flatter ourselves overmuch when we fancy that our vascular morphology is a new creation. The French have long understood the value of systematic anatomy. Brongniart made it a rule to preface the description of each fossil group with an account of the recent allied plants, and especially of their anatomy. He constantly found it necessary to make his own investigations, for just the points most needed for comparison with the fossils had usually been passed over in works on recent botany. "These researches," he says, "may not be without result for the comparative anatomy of plants, or for their physiology and natural classification" (p. 6). Artis, in 1825, had

felt the same need for a better basis of comparison. He says, "The whole Anatomy of the Plant must be studied," and cites Cuvier's famous researches on fossil animals as a model. This healthy reaction of fossil work on the investigation of living plants still goes on in our own day.

Brongniart gives an excellent account of the characters available for the discrimination of fragmentary specimens, and points out that while almost any organ will suffice to distinguish the main groups, for more exact determination the vegetative organs have a relatively greater importance in the lower and the reproductive in the higher classes. At the same time, the significance of vascular anatomy had long been recognised in the distinctive characters of Dicotyledons and Monocotyledons. "After the internal structure of the stem," he says, "the most important character of this organ is the mode of insertion of the leaves on its surface," then the arrangement of the vessels passing from the stem into the petiole, and in the leaves themselves the venation. We see that Brongniart, poorly provided at that time with structural material, was feeling about after external characters which might serve as the "outward and visible sign" of the structure within.

Comparative anatomy, he argues, forms the basis of zoological classification, and it will be the same for plants, only here the difficulty is greater, because a more or less high magnification is always required to show the structure. He especially regrets the absence, at that time, of any comparative anatomy of the wood, a need which even now has scarcely been adequately supplied. Let us see, a little more in detail, how Brongniart succeeded in applying his principles to the problems of fossil botany.

He recognised four periods of geological time, in which the vegetation had a special aspect due to the predominance of certain families and to the great development of the plants of these families. This recognition of successive periods of vegetation was in itself a great step in advance. Only a few years before, botanists had still expected to be able to refer the fossils of the Coal to recent species and appeared disappointed when they failed to do so. The same spirit still sometimes shows itself in our own day, among those who view anything like an intermediate fossil group with suspicion. Brongniart's four periods (characterised in his own words) were:—

1. Vegetation almost solely composed of Ferns and arborescent Horsetails and of the singular Lepidodendrons—gigantic plants sharing in the characters of Lycopods and Conifers. After the first period these plants seem to have disappeared, at least from the regions so far explored.
2. Characterized by very different forms, of which only a small number has come down to present times,—they are especially Ferns, less elevated than those of the Coal, and Conifers of a very peculiar aspect.

   [This refers essentially to the Triassic Flora.]

3. In the third Period the Ferns, and still more the singular family of Cycads, were dominant to such a degree that the species of the latter family were already more numerous than those now existing, and this little group, which only forms the 2000th part of living plants, constituted half the flora of that epoch. [Mesozoic.]
4. Plants much less different from those which still exist,—the same families and most often the same genera which still inhabit our climates. In spite of their analogy with recent vegetation, these fossils are no less worthy of our attention, for they may solve questions of great interest for the history of the latest changes in the surface of the globe: they can decide whether plants, like animals, have experienced great specific changes during the latest revolutions to which our globe has been exposed. [Tertiary.]

We must not suppose from these words that Brongniart was an evolutionist, for, as Saporta says, he always opposed evolution, the doctrine to which his own discoveries lent the strongest support. At the same time the whole tone of Brongniart's prospectus and introduction to his great book is thoroughly modern and enlightened.

His classification of plants was a singularly natural one, and indeed scarcely differs in its main divisions from our modern system. He has six great classes:—

I. Agames: Algæ, Fungi, Lichens [=Thallophyta].
II. Cryptogames celluleuses: Hepatics and Mosses [=Bryophyta].
III. Cryptogames vasculaires [=Pteridophyta, but with the addition of Characeæ].
IV. Phanérogames gymnospermes.
V. Phanérogames angiospermes monocotylédones.
VI. Phanérogames angiospermes dicotylédones.

There is little room for criticism here. The name Agames, which is used for Thallophytes, shows that little was known at that time of sexual reproduction in these plants, though the discoveries of Vaucher had already given the clue. Brongniart is quite sound on the Mosses, which he rightly says have nothing in common with the "Agames" beyond the absence of vessels. It must be remembered that at that time, owing to the splendid early work of Hedwig, the Mosses were much better understood as regards their reproduction than the Vascular Cryptogams.

Brongniart thought that the stems of the Vascular Cryptogams had some analogy in structure with those of Monocotyledons. He says that their organs of reproduction appear always to consist of two sexes; in those days, long before the advent of Suminski and Hofmeister, there must have been a certain amount of luck in arriving at this true conclusion. He explains further

on (p. 97) that the organs of fructification vary very much; sometimes one recognises easily enough organs which characterise two different sexes, sometimes only a single one has been, with any probability, discovered. He places the Characeæ, Marsileaceæ, Equisetaceæ, and some Lycopodiaceæ in the former category: the Ferns and most Lycopodiaceæ in the latter.

The inclusion of Characeæ in Vascular Cryptogams seems odd to a modern botanist; but we are scarcely in a position to scoff, for the true systematic relations of this family have never yet been made clear.

A striking merit of Brongniart's classification is the separation of the Gymnosperms in a class of their own, a point in which he was far in advance of most botanists of his own day and even of a much later time. He shows that the Gymnosperms are distinct from other Phanerogams both in their reproductive organs (the seeds, destitute of a capsule, receiving directly the action of the fecundating substance), and in the organisation of their stems, very different in many respects from that of true Dicotyledons (p. 22).

In the detailed part of the 'Histoire,' passing over the Fucoids and the scanty and doubtful Mosses, the Equisetaceæ are dealt with first of the vascular plants. The anatomy of recent forms is fully treated. It is curious to see what was then thought about their sexual reproduction. Hedwig had suggested that the spore was an ovary with a short style, while the elaters represented four anthers attached to the style by their filaments. Brongniart improves on this by supposing the spore to be an ovule, and the elaters four grains of pollen adhering to it.

As regards the Calamites, he says that up to that time everything had confirmed his idea of a relation between them and *Equisetum*. So far, however, he knew nothing either of the fructification or the anatomy of the fossil forms. The discovery of the latter, at a later date, long misled him and his school, and formed one of the great subjects of controversy with English and German investigators.

The rest of the first volume is devoted to the Ferns or the plants which he then classed as such, constituting by themselves, as he says, the greater part of the Flora of the ancient rocks.

As regards the reproduction of recent Ferns, Brongniart inclines to Hedwig's view that the stalked vesicles (glandular hairs) on the young fronds represent the male organs. At any rate, he finds "their analogy with the pollen-sacs of Mosses complete" (p. 141). His classification of Ferns is quite a natural one, only differing from modern systems in including the Tree-ferns (Cyatheaceæ) under Polypodiaceæ, and making the Parkeriaceæ (*Ceratopteris*) a distinct group, as was still done much later.

For the purposes of fossil botany he employs his well-known artificial classification based on the venation and form of the frond, a classification which is still indispensable for fossil taxonomic work.

The most curious point is that Brongniart at that time included

Sigillaria under Ferns, while he included Lindley's genus *Caulopteris* (true Tree-ferns) under *Sigillaria*, recognising that the fern-affinities of *Caulopteris* were more evident than those of the *Sigillariæ* proper. Brongniart shows that the Sigillarias could not have been Cacti, as Martius, or Euphorbiæ, as Artis had supposed, for they were not succulent, but woody plants. He argues that they could not have been Dicotyledons at all, for their form gives no indication of growth in thickness at the base of the stem. In view of subsequent developments, his rejection of growth in thickness is remarkable. Neither, he continues, could the Sigillarias have been Monocotyledons, for their leaf-scars are too narrow. Thus he arrives, by a process of exclusion, at the Vascular Cryptogams, "that is to say the Ferns, for that is evidently the only one of the families of this group to which one could refer the Sigillarias." He argues elaborately in support of this view; the Lycopod affinities seem never to have occurred to him at that time. It was no doubt the superficial resemblances between the Fern-stems and *Sigillaria* which misled him, though the comparison with *Lepidodendron* seems to us fairly obvious.

The incomplete second volume, the parts of which began to appear in 1837, is devoted, as far as it goes, to the Lycopods. He gives a most admirable account of the external characters of recent Lycopods and has a good deal to say about the anatomy, which he illustrates by some capital figures. He does not, however, distinguish clearly between the structure of *Lycopodium* and that of *Selaginella*, or *Stachygynandrum* as he called it. He notices the interesting fact that in some Lycopodiums the roots have practically the same structure as the stem (p. 24).

He is at pains to show that the anatomy of Lycopods and Conifers is essentially different. On the other hand, he lays great stress on the resemblance in the cones of the two groups, saying that in Conifers and Cycads the ovules are fixed on the scales exactly like the "capsules" of Lycopodiaceæ. In describing the two kinds of spores in "*Stachygynandrum*" and *Isoëtes* he calls the large spores "veritable seeds"; he compares the small spores to pollen-grains but declines to discuss their function (p. 33).

He is very emphatic on the Lycopod affinities of *Lepidodendron*, saying that the fossils of which that genus is the type merely form a special section of the family Lycopodiaceæ. "A fortunate and rare circumstance" had given him an opportunity of studying the internal structure. This, of course, refers to the famous *Lepidodendron Harcourtii*, first described by Witham in 1832, and afterwards by Lindley and Hutton in vol. ii. of their 'British Fossil Flora,' 1833. Brongniart's account of the structure shows a great advance on the previous descriptions. He was the first to recognise the ring of wood, with its smaller elements towards the outside. Oddly enough, this principal feature of the anatomy had been overlooked, or at least not clearly distinguished, by the English writers. The relation of the leaf-

trace bundles to the central axis was correctly followed; the restoration of the structure in the solid which he gives (Pl. 21, fig. 4) is remarkably accurate. In opposition to Lindley and Hutton, who had concluded that *Lepidodendron* was intermediate between Coniferæ and Lycopodiaceæ, Brongniart showed that the structure is essentially different from that of any Dicotyledon, gymnospermous or angiospermous (p. 44). He points out the differences from *Lycopodium* and *Selaginella*, and shows that the best anatomical comparison is with *Psilotum* and *Tmesipteris*.

He further points out the identity of the rayed or scalariform vessels of *Lepidodendron* with those of Lycopods, and the small size of the peripheral vessels in both, and concludes: "Thus, by the internal structure of their stems, as by their external form, their mode of branching and the arrangement of their leaves, the Lepidodendrons agree almost completely with the Lycopodiaceæ, and could be nothing else but arborescent Lycopods" (p. 46). His whole treatment of the subject is on sound modern lines.

He then asks the question, "Is the same analogy to be met with in their mode of reproduction?"

He begins by citing cases where the cones (*Lepidostrobi*) had already been found in connection with species of *Lepidodendron*—he found that they were borne on the ends of branches, like *Lycopodium* cones on a large scale, or like the cones of *Araucaria*. He was much puzzled about the position of the sporangium or capsule, which from the analogy of Lycopods and Conifers ("families between which all botanists are agreed in placing the Lepidodendrons") should be on the upper surface of the scale [he ignores the *male* cones of Coniferæ here]. Having no petrified specimens to work with, Brongniart at that time completely misunderstood the position of the sporangium, which in fact he had never seen, or had perhaps confused with the lateral wings of the scale. Lindley and Hutton, it is true, had already observed the sporangium in *Lepidostrobus ornatus*, but they had described it as a "seed"*, so that Brongniart not unnaturally suspected a confusion with the cones of Araucarian Coniferæ.

He was very cautious about the supposed relation of *Lepidodendron* to Conifers, regarding it as extremely remote. The former group, he says, is not intermediate between Lycopods and Conifers, but is at most a Lycopodiaceous genus tending to establish the first link in a series forming the passage between the two families (p. 55). Some of his arguments against a nearer relation, especially those drawn from the mode of branching and the structure of the wood, are well worthy of consideration.

Brongniart was distinctly less fortunate in his view of the petrified tree-fern stems known as *Psaronius*, which he regarded, on what seem to us very weak grounds, as representing the base of Lycopodiaceous stems. With all his good intentions, his knowledge of Fern-anatomy was not yet wide enough to guide

* 'Fossil Flora,' vol. i. pl. 26. fig. 2 *a*, p. 83.

him to the right conclusion, though it must be admitted that others had already been more fortunate. Brongniart, however, quite rightly interpreted the structure of *Psaronius*, as regards the distinction between the stem and the surrounding zone of roots.

The volume comes to a sudden end in the middle of a sentence on p. 72, while the author is discussing the nature of *Ulodendron*. The reasons given by Saporta, in his obituary notice of Brongniart, for the abrupt cessation of the work—the immensity of the scheme, the difficulties of the Tertiary floras, and the changes in the author's views—do not seem altogether sufficient. Brongniart lived and continued active work for more than thirty years afterwards. It is, however, no part of my plan to follow the later and more important development of his career.

Saporta rightly points out that in his early work Brongniart was the first to clearly enunciate the principle that there has been a definite and gradual development of vegetation in successive epochs.

Brongniart was a great botanist, as everything he wrote proves; by far the greatest who up to that time had undertaken the study of fossil plants.

In passing from him to Bernhard Cotta, we make a marked descent—Cotta was by no means great, but he did some meritorious work. His book, 'Die Dendrolithen in Beziehung auf ihren inneren Bau,' was published at Dresden in 1832, while Brongniart's first volume of the 'Histoire' was appearing. Cotta's work was based on his father's collection, which included more than 500 ground specimens of fossil plants. At that time such specimens were sometimes ground thin, to admit of microscopic investigation, but it does not appear that Cotta used the modern method of mounting really thin sections on glass—that was introduced contemporaneously in our own country by Witham and Nicol.

Young Cotta began his work as a sort of "holiday task"; he appears to have been a student at the time, and modestly desires that his figures may be regarded as the "Hauptsache," the text only as a necessary explanation.

Cotta was much impressed by the evidence of a tropical climate found in the rich vegetation of the Coal-measures. He adds: "But not only in reference to climatic changes, but also with respect to the gradual development of organic Nature, it is interesting that we find more lowly organised plants in the older than in the later rocks. It is possible, however, that this latter circumstance proceeds merely from differences of climate, for in the Red Sandstone, for example, besides many lower plants, remains of Dicotyledonous plants also frequently occur, of which the numerous petrified woods with evident annual rings and medullary rays afford the best proof" (p. 3).

Cotta no doubt made too much of his favourite climatic changes, but there is some force in what he says: *e. g.*, the difference

between the plants of the root-nodules and those of the seam-nodules in Lancashire coal beds is clearly due to different conditions rather than to different age. Like Brongniart, he expresses his regret that "we unfortunately still possess no botanical work in which the internal structure of the races of plants is characterised. In this respect it would be especially desirable to know accurately the internal structure of the stems of Palms and Tree-ferns, which in the forests of America grow into such gigantic trees" (p. 7). He realised the difficulty of naming the fragmentary fossil remains without the risk of bringing the separate parts of one and the same plant under different species. He bases his own arrangement on internal characters, not that he considered these the best (though they might be so if the anatomy of recent plants were better known), but because no other characters were available in his petrified specimens. He realised that there are whole fossil families which no longer exist, so far as is known, in the living Creation (p. 11).

Cotta's classification was rudimentary. He divided his specimens into three groups: Rhizomata, Stipites, and Radiati—a classification of fossils rather than of plants.

His first group he calls the rhizomes of extinct Ferns, in which he was roughly right. His genus *Tubicaulis*, of Permian age, may be said to correspond to the family Zygopterideæ, as understood by the latest writer, Paul Bertrand. This is a group of the early Ferns—Primofilices of Mr. Arber—of which so much has been heard of late. Before Cotta, these fossils had been placed in the Palms, though D. Anton Sprengel had already called them "exotic Ferns." The genus *Tubicaulis*, as now limited, includes one only of Cotta's species, based on a single, very fine specimen which had been discovered in 1815. A second specimen of a distinct species was brought to light in Lancashire nearly a century later, and described by Dr. Marie Stopes. Cotta nowhere distinguishes clearly between the petioles and the true stem of these plants.

He follows his predecessor D. A. Sprengel in classing *Psaronius* (also Permian) with Ferns, and in this respect did better than Brongniart. The name "Starling-stones" for these ornamental fossils is familiar; it may not be so generally known that this name properly applies only to the specimens showing the *roots*; those in which the long, curved sections of the vascular bundles of the stem are visible used to be called "Maggot-stones," "Madensteine," "*Psaronius helmintholithus*." In earlier days these fossils had been regarded as Corals or Encrinites.

In certain cases Cotta recognised the roots as such, though he more often interpreted the same bodies as leaf-stalks.

His second group—Stipites or Trunks—includes fossil stems from much later rocks, which he rightly classed as Palms.

The third family, Radiati, or radiately striated stems, is of considerable interest—it embraces, as one might judge from the family-name, stems with secondary thickening. He says that

these specimens, which he placed in two genera, *Medullosa* and *Calamitea*, have no analogue among living plants.

His description of the genus *Medullosa*, which he founded, is on the whole remarkably accurate, and some of his figures are excellent and might still be used as adequate illustrations. Two of his species, *M. stellata* and *M. porosa*, are the real stems; the third, *M. elegans*, consists of the leaf-stalks (afterwards *Myeloxylon*). It is odd that he should have placed these in the right genus, for of course the structure is totally different from that of the stem. He no doubt mistook the hypodermal strengthening zone of the petiole for the outer ring of wood in the stem.

In the description of the stem of *M. stellata*, he interpreted the complex structure with surprising success, considering that it is quite unlike anything in recent plants, consisting as it does of a double system of peripheral and central steles, each growing in thickness by its own cambium. In fact he practically recognised the "polystely" (to anticipate more than half a century), for he describes the pith as containing many-rayed stellate columns, constructed on the same plan as the radiating outer zone, which he saw was itself a compound structure. He points out that each radiating portion forms a whole by itself and possesses a special pith (einen besonderen Markkern) (p. 65). He rather spoils his excellent observations, however, by suggesting that the internal stellate columns might be young plants which grew up inside an old hollow stem!

His second genus of "Radiati," *Calamitea*, may, he says, with much probability be supposed to have a common origin with the Calamites, so well known as impressions (p. 57). On this point his knowledge was decidedly in advance of Brongniart's at the same time. He arrived at this right conclusion by comparing the striations of his petrified specimens with those on the casts (p. 67). His *Calamitea striata* = *Calamodendron striatum*, Goeppert, and his *Calamitea bistriata* = *Arthropitys bistriata*, Goeppert. Thus he had already recognised the two chief groups of Calamarian stems.

Cotta's "Supplementary Remarks" are partly on the subject of the mode of preservation, but their chief object is to correlate the impressions with the petrifactions, a laudable attempt in which, with the one exception of the Calamites, he was singularly unsuccessful.

He was inclined to identify *Tubicaulis* with *Lepidodendron*, some species of which (including the well-known *L. obovatum*) he regarded as Ferns. He compares the ribbed *Sigillarias* with Cacti, a view which, oddly enough, has re-appeared in the present day in a work by the geologist Steinmann. At the same time Cotta identified these Sigillarian stems with his genus *Medullosa* (p. 84).

As regards the Calamites, which he rightly identified, he was misled, like Brongniart in later days, by the internal structure, though not to the same extent. He argues against their being

Equisetaceæ, but suggests that they may represent an extinct family intermediate between Equisetaceæ and Casuarineæ!

On the whole Cotta's book is not to be taken too seriously from a scientific point of view. He was only a beginner at the time, and evidently no great botanist. His observations, however, were good, and sometimes his natural instinct led him right when more learned authorities went wrong.

To us, in this country, the most interesting figure among the group we are considering, is that of Henry Witham. His real name was Henry Silvertop; he was born in 1779, and took the name of Witham on his marriage. He was a man of considerable property and importance in the North of England, and was the first Roman Catholic High Sheriff of the County of Durham. His work on fossil plants belongs to a short period of his life, when he was about 50. He was the founder of modern structural fossil Botany in so far as he was the first man who used thin sections mounted on glass—the discovery of this method was due to Nicol, to whom he fully acknowledges his indebtedness, as he does also to Macgillivray, who made the drawings and also no doubt helped with his botanical knowledge.

In an early paper "On the Vegetation of the First Period of an Ancient World," read before the Wernerian Society of Edinburgh on Dec. 5, 1829, Witham shows himself still much under the influence of Brongniart. He regards the "Craigleith Tree," first discovered in 1826, and now known as *Pitys Withami* (L. & H.), and other Gymnospermous Phanerogams of Carboniferous age as trifling exceptions to the general distribution of early vegetation. He says: "We find the opinion of Mr. A. Brongniart most completely verified, namely that the Vascular Cryptogamic plants had a vast numerical proportion, and in fact of 260 species discovered in this Terrain or period, 220 belong to this Class." Witham very soon modified this opinion, as we shall see. It appears that a section of the Craigleith fossil—a manifest Gymnosperm, one would think—had been sent to Brongniart, who replied: "I cannot now give a final but only a conditional opinion. It is that I believe it to be a section of a Monocotyledonous plant." This strange conclusion, which seems to have been shared by some local botanists, though not, of course, by Witham himself, can only be explained by the state of preservation combined perhaps with a certain prejudice, at that time, in favour of the greater antiquity of Monocotyledons.

In a letter to Winch, a Newcastle naturalist, dated Dec. 23, 1829, accompanying this pamphlet and preserved in Winch's correspondence in our own Library, Witham goes into the interesting question of the presence of annual rings in the early Gymnosperms. He says: "I have as yet been unable to discover any concentric rings in the Wideopen fossil [*Pinites*, now *Cordaites*, *Brandlingi*] . . . . . I sent Mr. Hutton a beautiful slice of the Wideopen tree, which to look at with the naked eye would have inclined one to believe they were there, but upon microscopic

examination such idea appears to me to vanish." This exactly expresses the usual state of the case in stems of that period.

In the paper "On the Vegetable Fossils found at Lennel Braes, near Coldstream," read May 10, 1830, Witham shows that these trees (*Pitys antiqua* and *P. primæva*, Witham) "must be classed amongst the dicotyledonous plants" (p. 11). He attributes (not quite accurately) the opinion to Brongniart that "out of six classes only two existed at that time, namely the Vascular Cryptogams and the Monocotyledons, the latter containing a small number of plants which appear to resemble the Palms and arborescent Liliaceæ ..... The existence therefore of so extensive a deposit of dicotyledonous plants at this early period of the earth's vegetation appears to demand the attention of the naturalist."

In his "Description of a Fossil Tree discovered in the Quarry at Craigleith, near Edinburgh, in the month of November, 1830,"* Witham speaks of this fine tree having flourished "for aught we can say a million years ago" (p. 4). He had evidently frankly accepted the teachings of the young science of Geology, which was not the case with all English writers at that time. He says: "Several scientific gentlemen having stated as their opinion that this fossil is a *Lycopodium*, I may here mention the reasons why I have come to a different conclusion" (p. 5). And further on he adds: "In conclusion I beg to add, that we have in this striking and stupendous relic of ages long gone by, an additional proof amongst many others lately advanced, that plants belonging to the Gymnospermous Phanerogamic class are much more abundant in these early sedimentary deposits than continental writers would lead us to believe" (p. 10). It was in fact Witham's chief work to demonstrate the early prevalence of Gymnosperms, as is more fully shown in his book 'The Internal Structure of Fossil Vegetables,' 1833, which brings together and correlates his various investigations.

"Many fossil vegetables having lately been found, particularly in the mountain-limestone series and coal-fields, belonging either to the Coniferæ or to a family closely allied to them, I am induced to believe that those geologists who maintain that the vascular cryptogamic plants almost entirely composed the flora of that first period labour under a misapprehension" (p. 6).

"That the preponderance of vascular cryptogamic plants was considerable, I do not wish to question .... From the frequent occurrence of trees possessing an exogenous structure I cannot help suspecting the correctness of the assertion that 'the class which almost of itself composed the flora of this period is that of the vascular cryptogamic plants, and in fact that of 260 species discovered in this formation, 220 belong to that class'." A few years before Witham had accepted this statement, but now his

* Nat. Hist. Soc. Northumberland, Durham, and Newcastle-upon-Tyne; read Dec. 28, 1830.

views had matured. He was, in fact, the first to challenge the description of the Palæozoic period as the "Age of Cryptogams." The latest progress of the science has been on the same lines as his. Witham rightly emphasized the high organisation of the early floras, though somewhat overstating the case owing to his not having fully grasped the width of the distinction between the Gymnosperms and the true Dicotyledons.

He regarded the predominance of Vascular Cryptogams as indicating the presence of a damp forest, where the remains of the plants had been preserved *in situ*, while the Phanerogamic fossils represented a hill flora, from which the trunks had drifted down streams into lakes or pools.

The absence of concentric circles, and especially the nature of the pits—the longitudinal series of hexagonal markings on the walls of the wood-cells facing the medullary rays,—led Witham to infer that the Craigleith trees "are not Coniferæ, or at least not in all respects similar to the Coniferæ of the present day." He extends this inference to the allied species, and concludes: "It is, however, certain that hitherto no structure precisely resembling that of the Coniferæ in every respect has been found in the Mountain limestone series or in the Coal formation; but the alleged absence of phanerogamic trunks in these deposits has been fully and, I trust, satisfactorily refuted" (p. 49). His conclusion is strictly correct, though the grounds on which he based it may not be perfectly convincing. He recognised that the Liassic and Oölitic woods which he placed in the genus *Peuce*, are evident Conifers, which the older fossils are not, though "of the same natural family" (p. 69).

Witham's work on the fossil Gymnosperms was perhaps the most important of his life; he also has the credit of having been the first to describe the structure of a fossil Lycopod, for we owe to him the original description and figures of *Lepidodendron Harcourtii*, "beyond all doubt," as Lindley and Hutton said, "the most remarkable discovery in the science of Fossil Botany."* Witham himself showed equal enthusiasm. He says: "I had so repeatedly examined the stems of vascular cryptogamic plants without detecting any trace of organisation, that I cannot refrain from mentioning the delight which I experienced when I observed a structure so perfect. I am the more gratified as it affords me an opportunity of corroborating the opinion of so distinguished a botanist as Mr. A. Brongniart, though founded solely upon the external markings of the peculiar plants."†

He compared the structure with that of the stem of *Lycopodium clavatum*, but it is not surprising that he was not altogether successful in interpreting so unfamiliar a type as that of the *Lepidodendron*.

* 'Fossil Flora,' vol. ii. p. 46.

† "On the *Lepidodendron Harcourtii*." Read at the Natural History Society of Newcastle-upon-Tyne, March 1832.

Anabathra pulcherrima, a Lycopod with secondary growth in thicknesss, was another fossil investigated by Witham, who, however, did not attempt to determine its affinities. "Whatever, therefore, may be the family to which the plant in question is ultimately referred, it is necessary to institute a provisory genus for its reception" (p. 42). He fully satisfied himself of the existence of medullary rays, a point about which very unnecessary difficulties were raised at a much later date.

Witham was a modest author. He writes: "My pretentions to botanical knowledge are indeed very limited, nor do I presume to rank myself among the cultivators of a science to which so many eminent individuals have devoted themselves in this country. The only object I have always kept steadily in view, is to direct their attention to a department of botany which has hitherto been too much neglected; for, although the study of the external forms of the stems, leaves and fructification, of recent vegetables, has elicited much knowledge respecting the nature of the former, little has been effected by an application to their internal composition, in which decided and characteristic differences are nevertheless to be found. It is by the recently discovered method of cutting and polishing the stems of fossil plants that we are enabled to obtain an insight into their structure."* Witham was deeply impressed with the importance of the work which he was undertaking, and showed a serious and almost religious enthusiasm which we cannot but respect.

The few fragments from the earlier history of a modern branch of science which I have ventured to recall to your memories are of interest as showing that the problems before the investigators of those days were essentially the same as our own, and that the spirit in which they approached them is one which we may well emulate. The birth of Geology is one of the most interesting events in the history of science, and forms an integral part, as Prof. Judd has recently so well shown, of the History of Evolution. The spirit of Evolution was already in the air, and we, in post-Darwin days, find ourselves in complete sympathy with the work that was going on in palæontology at a time when the 'Beagle' had scarcely started on her momentous voyage.

The President, having delivered his Address, Lieut.-Col. Prain moved:—

"That the President be thanked for his excellent Address, and that he be requested to allow it to be printed and circulated amongst the Fellows," which being seconded by Prof. F. W. Oliver, was carried by acclamation.

* 'Internal Structure of Fossil Vegetables,' pp. 1–2.

The President, then addressing Count Solms-Laubach, said:—

Count Solms-Laubach,

It is a great pleasure to me that it falls to my lot to present to you, on behalf of the Society, our Linnean Medal, awarded for the highest distinction in Biology.

The wide range of your work, almost unequalled in these days of specialisation, covers morphology, development, ecology, physiology, the systematic both of Phanerogams and Cryptogams, the history of cultivated plants, the geography of plants, and, last not least, fossil botany.

Your earliest work was in a difficult field, in which you soon made yourself the leading authority, the morphology and affinities of parasitic Flowering Plants, beginning in 1863 with a paper on an *Orobanche*, followed, a couple of years later, by your dissertation, 'De *Lathræa* generis positione systematica.' An important general paper on the structure and development of parasitic Phanerogams (1868) was succeeded by a series of monographs on the families Lennoaceæ, Rafflesiaceæ, and Hydnoraceæ.

Turning to another subject, you monographed the Pandanaceæ, Pontederiaceæ, Caricaceæ, and Aristolochiaceæ, and in more recent years have interested yourself in the Cruciferæ and Chenopodiaceæ.

The first of your Cruciferen-Studien, 1900, describes the remarkable case of *Capsella Hegeri*, to all appearance a new species, which has sprung into existence in our own time.

Your systematic work extended to Cryptogams, and we had the honour of publishing in our own Transactions your fine monograph of the Acetabulariaceæ, calcareous Algæ of special interest from their relation to early fossil types.

In other works you have thrown new light on the structure, taxonomy, and distribution of Vascular Cryptogams, Mosses, Hepatics and Fungi.

A feature of special morphological interest is discussed in your paper on Monocotyledonous embryos with terminal growing points. You have touched on physiology in your work on the occurrence of calcium oxalate in the walls of living cells.

In another direction again, of more human interest, and of wide evolutionary bearing, you have treated with much learning and ingenuity the history of cultivated plants, such as the Fig, the Papaw, the Wheats, Tulips, and Strawberries. I am glad to hear that your important historical researches are still in active progress during your present visit to England.

Your work on the Principles of Plant Geography (1905), a critical review of the leading ideas on the distribution of plants, is characterised, like all your writings, by breadth and originality of thought, and is exercising a wholesome influence on the progress of this great subject.

I should like especially to recognise how you have always zealously pursued systematic botany, side by side with every

branch of laboratory work, an example which we in this country will do well to lay to heart.

Lastly, I come to your contributions to fossil botany, the side of your work with which I happen to have been in closest touch. Beginning in 1883–84 with papers on the fossil fern *Scolecopteris elegans* and on Permian Coniferæ, you published in 1887 your 'Einleitung in die Paläophytologie' (translated five years later, for the Oxford Press), a book which marks an epoch in the history of this science. To many, like myself, who had never till then realized the wealth and significance of the fossil material, this truly scientific exposition must have come as a revelation. In my own case it prepared me to appreciate the treasures of the Williamson Collection, and the work of our dear old friend himself, which you alone, at that time, were able to estimate at its true value.

Since then you have continued to enrich our science by a series of memoirs of the utmost importance. To recount them all would be to write the history of fossil botany during the last quarter of a century. I may mention the work on the English Greensand fossil, *Bennettites Gibsonianus*, the type of an extinct family, dominant in Mesozoic times; on the Cycadofilices or Pteridosperms, to use a later name (a group which you and Williamson were the first to recognise), *Protopitys*, *Medullosa*, *Völkelia* and *Stelaxylon*; on the Lower Carboniferous plants (now likely to prove of Devonian age) of Falkenberg and Thuringia; on *Stigmariopsis*, *Pleuromeia* and many more,—all researches which have done much to transform fossil botany and to place it in its present strong position as a worthy ally of animal palæontology. In this subject also your work is as active as ever, and I am delighted to hear that you are about to elucidate further the structure of that wonderful genus of Palæozoic tree-ferns *Psaronius*, the first group of fossil plants showing structure to attract attention, and still among the most interesting and difficult.

I ask you to accept this medal as a symbol of the deep admiration and affection of your English colleagues, and as the highest recognition which this Society can bestow.

The recipient having received the Medal, expressed his thanks as follows:—

Mr. President, Ladies and Gentlemen,

It has not been an easy matter for me to come to London this spring, but as I am fond of this country, where I have so many friends, and have always been received with the greatest kindness by public institutions as well as by private persons, it seemed to me to be my duty personally to present my most hearty thanks to this Society, the first of all the great societies to receive me as a member, and now has awarded me the highest honour in its power, an honour I can only accept with the proviso "Magnis in rebus voluisse sat est."

It is, further, a great pleasure for me to receive this medal, awarded by the Council, from the hands of our President, Dr. Scott, my friend and fellow-worker in palæophytological matters.

I am now approaching the age of seventy, and my work is essentially done; but should God permit me some further time of strength and health, this medal will be a further stimulus for me to employ it entirely to the benefit of our beloved biological science.

The General Secretary having laid before the Meeting the Obituary Notices of deceased Fellows, the proceedings terminated.

OBITUARY NOTICES.

Thomas Hodgson Archer-Hind was born in the year 1814, and when at Eton from 1826 to 1832 was contemporary with Mr. W. E. Gladstone, the future Bishop Selwyn, and other notable men. He went up to Trinity College, Cambridge, graduated B.A. in 1837, and proceeded M.A. in 1840. He was elected Fellow of our Society on the 4th March, 1834, and had therefore, for many years, been Father of the Society.

In 1856, on succeeding to an estate, he added the name Archer-Hind to his original Thomas Hodgson, and from 1872 he lived at Coombe Fishacre House, Newton Abbot, Devonshire.

Possessing a keen delight in plants all his life, and delighting in his charming garden, he seems never to have appeared in print during his long career. Up to the last year our Librarian was accustomed to receive an annual letter, written in a legible and steady hand, requisitioning the Transactions to which he was entitled. He died on the 3rd February, 1911. [B. D. J.]

Richard Henry Beddome was born in 1831, educated at Charterhouse, and joined the Military service of the H.E.I.C. on its Madras establishment in 1848. In 1856 the Madras Government took steps to organize a Department of Forestry, and in the year following, Beddome, who was then Quartermaster and Interpreter of his regiment, the 42nd Madras Native Infantry, was selected, on account of his devotion to Natural History in different branches, and proficiency in Botany, as chief Assistant to the first Conservator, Dr. H. Cleghorn. One of his first duties in this post was an exploration of the Pulney Hills, even now too little known scientifically, and the botanical results appeared in the *Madras Journal* (n.s.) iii. (1858), pp. 163–202. The time allotted to this survey was necessarily brief, but it added more than one species to the local Flora and the published account remains of much interest to the present day. In 1859 Beddome contributed to the same Journal (iv. pp. 66–73) a valuable paper on the South Indian and Ceylon species of the difficult genus *Impatiens*.

In 1860 Cleghorn retired and Beddome succeeded him; in 1863 he brought out, mainly for the use of foresters and planters, his 'Trees of the Madras Presidency,' and this was followed by the 'Flora Sylvatica for Southern India,' giving descriptions with figures of all the principal timber trees and large shrubs of South India and Ceylon. The three hundred and thirty quarto plates, executed under the author's supervision by native artists, are remarkable for clearness and accuracy. Combined with this work is a 'Foresters' Manual' of the local Flora, illustrated by twenty-nine lithographed sheets of analytical drawings of genera not represented in the main series. This work appeared in parts during 1869 to 1874, when it was completed. Side by side with these substantially official labours, Beddome steadily adhered to Natural History as a personal pursuit in such leisure as his public duties permitted. Even after his appointment as Conservator he had communicated papers on zoological subjects to different publications, including the Zoological Society's 'Proceedings' for 1863 (pp. 225–229); but he gradually limited the field of study to Botany, and from 1863 his work was mainly concentrated on Ferns and their allies.

In 1863 he published the 'Ferns of Southern India'; from that year to 1870 parts appeared of the 'Ferns of British India,' dealing with those species which, not having been recorded from the area covered by the 'Ferns of Southern India,' were not treated in that work.

A Supplement to these two publications jointly was issued in 1876, bringing the total number of ferns figured up to 661; with the majority of which the author was directly acquainted.

Although now devoting his energies mainly to *Filicales*, between 1869 and 1874 Beddome brought out three hundred figures with descriptions of remarkable flowering plants from South India and Ceylon under the title of 'Icones Plantarum Indiæ Orientalis' (Madras: Gantz Brothers, 1874, 4to).

Retiring from the service of the Crown with the rank of Colonel in 1882, he published in the year following his 'Handbook to the Ferns of British India, Ceylon, and the Malay Peninsula' (Thacker & Spink, Calcutta, 1883). This was based on the larger works already mentioned—that is to say, the 'Ferns of Southern India' and 'Ferns of British India,'—the descriptions, however, being more succinctly framed and the figures (woodcuts) being reduced from the original illustrations. The 'Handbook' was designed to meet the wants of a wider public than the previous undertakings, and met with an excellent reception both with the public and in scientific circles.

Beddome made his home at Putney, where he devoted himself enthusiastically to horticulture, while in no way relaxing his interest in the taxonomic side of Pteridology. A frequent visitor to Kew, and a contributor from time to time of rare or interesting plants to the Royal Gardens, he also gave valuable aid to the staff of the Herbarium by naming sets of Ferns and their allies

from the Indo-Malayan region; and within a few weeks of his decease he had worked out the whole of the Malayan material at Kew of *Selaginella*. His name appears in the Kew Herbarium Visitors' Book for the last time on the 27th January, 1911; on the 23rd February he succumbed at his residence, after a very brief illness, to an attack of heart-trouble, leaving a widow, daughters and grandchildren. His last published contribution to botanical literature was a paper entitled "Notes on Indian Ferns" in the Journal of the Bombay Natural History Society, April 13, 1908. To the Journal of the Royal Horticultural Society, of which he was a Fellow, he contributed useful annotated lists of *Campanula* (1907), Gesneraceæ and Acanthaceæ (1908). In 1898 Beddome presented his collection of Mosses to Kew; his Phanerogamic herbarium is well represented in the Royal Herbarium, also in the Herbarium of the Botanical Department, Madras; while many fine specimens of trees and flowering plants collected by himself in Southern India are preserved in the Natural History Museum at South Kensington, to which a selected set of his Ferns was also distributed. The bulk of his own set of the Ferns has been presented by Mrs. Beddome to Kew.

As a horticulturist in his Surrey home, Beddome was for nearly thirty years indefatigable and successful, repeatedly flowering rare or little-known species, which were exhibited at the Royal Horticultural Society's shows, or figured in the 'Botanical Magazine'; he was keenly interested in practical questions of hybridization and selection, and the annual view of his Chrysanthemums, to which friends were hospitably invited, was widely appreciated.

For those who enjoyed his personal friendship, the blank caused by his death cannot be filled; while his personality, keen and active in spite of his age, will be missed by all who knew him.

He was elected Fellow of this Society on the 2nd March, 1882, although a short note of his, extending only to half a page, communicated by Dr. Thomas Thomson, was read on 17th November, 1864, and published in the Journal; it was descriptive of his *Pœciloneuron indicum*. He preferred to delay his connection with this Society until he could make full use of it.

[J. R. Drummond.]

James Bisset was born on the 4th June, 1843, and from his boyhood was keenly interested in natural science, particularly botany. His business took him to Japan in the early sixties, at the time when the great changes were taking place which have resulted in the modern Japan. He made extensive collections of Japanese plants, and corresponded with Maximovitch, who named several plants after him, e. g. *Viola Bisseti*. After living twenty years in Japan he came home in 1886, and for some years he lived at Banchory in Aberdeenshire, then, in 1892, he moved to Oxford, to gratify his ambition to graduate there, and, at the age of 47, he matriculated with a view to graduating in honours in the School of Natural Science. He had intended to take botany as

his chief subject, but found the needed amount of microscopical work too trying for his eyesight, and he then turned to geology, in which subject he passed with honours in 1896, at the age of 51; he proceeded M.A. in 1899. It was not till he was in the middle of his University career that he retired from business.

Upon taking his degree, he moved to Edinburgh and threw himself into local scientific work; he was a Fellow of the Royal Society of Edinburgh, the Royal Physical Society, and a member of the London and the Edinburgh Geological Societies. He joined the Linnean Society, 21st April, 1881.

His published papers were, "List of Desmidiaceæ found . . . . in the neighbourhood of Lake Windermere during 1883," which appeared in Journ. R. Micr. Soc. ser. 2, iv. (1884) 192–197, and in conjunction with Dr. John Roy, in the 'Scottish Naturalist' in 1893–94, comprising 64 pages on Scottish Desmids.

He died on 3rd April, 1911, at Edinburgh. [B. D. J.]

John Bennett Carruthers, F.L.S., F.R.S.E., died in Trinidad at the early age of 41, on July 17, 1910. He was born at Islington on January 19, 1869, son of the then Keeper of the Department of Botany of the British Museum, William Carruthers. He was educated at Dulwich College, the Royal School of Mines, and University College. Having decided for a botanical career, he devoted himself more particularly to the study of Algæ, first under George Murray of the British Museum, and afterwards under Prof. Schmidt in the University of Greifswald. After his return to England he assisted his father, then Consulting Botanist to the Royal Agricultural Society, and, at the same time, acted as lecturer on botany at Downton College and at the Royal Veterinary College, until in 1897 he went, for the Planters' Association, to Ceylon to investigate a disease which threatened the Cocoa plantations. He delivered himself so successfully of his task that in 1900 he was appointed Mycologist to the Government of Ceylon and Assistant-Director of the Botanic Gardens at Peradenyia. Five years later he went to the Federated Malay States as Director of the new Department of Agriculture. This post he held until 1909, when he accepted an appointment as Government Botanist and Assistant-Director of Agriculture in Trinidad. During an official visit to Tobago he contracted fever which, after a prolonged illness, led to his premature death. J. B. Carruthers was eminently a practical botanist, his principal achievements being in the sphere of Tropical Agriculture and plant pathology, and he was considered an authority on rubber cultivation. His publications were not numerous and, apart from one on the cystocarps of some Algæ, dealt with economical matters.

He was elected a Fellow of the Linnean Society in 1890 and of the Royal Society of Edinburgh in 1906. His rapid promotion speaks sufficiently for the high appreciation which his knowledge

and work found in official circles, whilst he was not less esteemed by his numerous friends for his genial and loyal character.

[O. S.]

William Ambrose Clarke was born at Hinckley, Leicestershire, on the 6th February, 1841, the son of the Rev. T. A. Clarke, of Stapleton. He was articled to a Chippenham solicitor, and afterwards practised in that calling in the town. He became interested in botany, and formed acquaintance with the Rev. T. A. Preston of Marlborough College, helping in the 'Flora of Marlborough,' issued in 1888. In 1892 he married and moved to Oxford, where he spent the rest of his life.

In 1892 onwards he published in the 'Journal of Botany' the first records of British Plants, which was issued as a volume in 1896, followed by a second revised edition in 1900.

He was elected a Fellow on the 4th December, 1890, but withdrew on the 7th February, 1901; later he was again elected 4th March, 1909.

The writer is indebted to the account of Mr. Clarke given in the 'Journal of Botany' for May 1911 for most of the facts above given.

[B. D. J.]

Theodore Cooke, C.I.E., M.A., LL.D., M.I., F.L.S., was born at Tramore, Co. Waterford, Ireland, in 1836, as the eldest son of the Rev. J. Cooke. He was educated at Trinity College, Dublin. After having graduated in 1859, he went to India as an engineer in the service of the Bombay, Baroda, and Central India Railway. Five years later, in 1865, he was appointed Principal of the Civil Engineering College at Poona, or, as it was afterwards, the Poona College of Science, and he continued in this position until 1893, when he retired. During his tenure of this post he also acted temporarily as Director of Public Instruction, Director of Land Records and Agriculture of Bombay Presidency, and as Dean of Faculty and member of the Syndicate of the University of Bombay. From an early date he paid careful attention to the flora of the presidency he lived in, and brought together very considerable collections. When in 1891 the Botanical Survey of India was established, he was entrusted with the survey of Western India. He soon conceived the plan of writing a 'Flora of the Presidency of Bombay'; but it was not until 1898 that his proposal was approved by the Secretary of State for India. He was by that time 62, an age when a much younger man might have shrunk from undertaking such a task, particularly if it was, as in Cooke's case, his first attempt at writing a flora, or in fact anything botanical. But Cooke had, in a quiet way, built up for himself a knowledge of the plants of his area which was surprising even to his friends when it disclosed itself. This, combined with an admirable method and regularity of work, was the foundation of the remarkable success of his Flora, the first part of which appeared in 1901. After that, part

followed part without a single hitch, until, in 1908, with the eighth part, the work came to a conclusion. For clearness, precision and method, Cooke's 'Flora of the Presidency of Bombay' will always be a model. The plant-material on which it was based consisted, apart from the older specimens in the Kew collections, almost entirely of his own extensive herbarium, which he brought with him to Europe, leaving a duplicate set at Poona, and when subsequently the Poona Herbarium was burned, he, very unselfishly, handed over his own set to the Poona College to form the nucleus for a new Herbarium. After the completion of his 'Flora' he undertook to work out certain families for the 'Flora Capensis.' He finished the genera *Plectranthus*, *Coleus*, *Pycnostachys*, *Æolanthus*, *Hyptis*, and *Mentha* of Labiatæ, and the families of the Plantaginaceæ, Nyctaginaceæ, and Illecebraceæ. But whilst working at the Amarantaceæ he was seized with his last and fatal illness.

In Theodore Cooke botany lost a serious worker who came forward late in life, but with unabated energy and ripe experience, whilst his friends mourned in him the man, kind, genial and broad-minded. He was made an LL.D. by his University and created a C.I.E. in 1891. He was further a member of the Institute of Civil Engineers, Ireland, of the Anthropological Institute of Great Britain, and a Fellow of the Geological and—since 1892—of this Society. [O. STAFF.]

ALFRED RUSSELL FOX, who died at Sheffield, 5th December, 1910, after a long illness, was born in that city in 1853, and on leaving school was apprenticed to his father, a pharmaceutical chemist, with whom he became a partner in 1876, and the following year his name was enrolled in the Pharmaceutical Society.

He identified himself with municipal work, and particularly with the work of local natural history societies. An ardent field-botanist, he was much appreciated as a lecturer on his favourite pursuit. He was one of the oldest members of the Sheffield Field Naturalists' Society and of the Sheffield Microscopical Society.

His connection with this Society dated from 15th June, 1899. [B. D. J.]

EDWARD GERRARD, an Associate of the Society, elected in 1862, was born in Oxford, October 20, 1810. While he was still in his childhood, his parents came to London, and settled at St. Pancras, where he continued to reside during the many years of a longer life than is granted to the majority of mankind. In 1836 he entered the service of the Zoological Society on the same day as the late Mr. G. R. Waterhouse, whom he assisted in the curatorial work of the Society's Museum. It is recorded that this Museum at that time contained 6720 exhibited specimens of Vertebrata; and it was here that he laid the foundation of his knowledge of

Vertebrate Zoology. Dr. J. E. Gray, a frequent visitor to the Society's Museum, recognized the worth of the young man, and induced him to exchange his post for one in the British Museum; and on April 5, 1841, he was appointed an Attendant of the First Class in the Department of Zoology. In this modest position he worked for 55 years; and never had the Museum a more industrious, more conscientious, more devoted servant than Edward Gerrard; he was Dr. Gray's right-hand man, always the best of my friends, and equally helpful to me in later years.

When Gerrard entered upon his new duties he was just in time to bear a hand in the removal of the Zoological collections from Montague House into the new Museum at Bloomsbury, and to form there the new exhibition of Mammals; it consisted almost exclusively of mounted skins; but Dr. Gray, who fully understood the importance of osteology for his systematic studies, set immediately to work with his usual energy to supply this desideratum. In this Gerrard's assistance was invaluable to him; only a few of the skeletons were mounted, the majority being kept disarticulated in wooden boxes in a large basement-room in which a fire had to be kept all the year round to prevent the boxes and labels from getting damp and mouldy. Here Gerrard could be found engaged in arranging the collections and preparing a systematic Manuscript Catalogue. Dr. Gray's 'List of Osteological Specimens in the British Museum' (1847) was based upon that Manuscript; and a greatly enlarged later edition, 'Catalogue of the Bones of Mammalia in the British Museum' (1862), was almost wholly Gerrard's work. This collection remained the centre of his solicitude and its care his favourite occupation. It was a proud day for him when he saw the magnificent series of skeletons, with the individual history of which no one was more intimately acquainted than himself, set up for the first time for exhibition, filling an entire gallery in the new Museum at South Kensington in systematic arrangement. Great was his mortification that he had to witness the breaking-up and dispersal of this unique exhibition at the time of his retirement from the Museum.

Besides this special work, Gerrard had other important duties to perform in the Department. A general supervision of the acquisitions of former years, and the registration and conservation of all new accessions to the classes of Mammals, Reptiles, Batrachians, and Fishes, were entrusted to him, until by additions to the staff some of these duties could be assigned to others.

After 55 years of service Gerrard retired in 1896. According to a "Minute" of the Trustees' meeting on July 25, "the Trustees in accepting Gerrard's resignation, desired the Director to express to him their high appreciation of his very long-continued and faithful service." This "appreciation" is probably unique in the annals of the Museum, as regards a member of the class of Attendants.

Gerrard was endowed with an unusually strong constitution,

which he retained unimpaired almost to within the last year of his life, owing to his frugal and regular habits. The days on which during those 55 years he was compelled by indisposition to absent himself from duty were very few; in fact, I cannot remember one. Daily, in all weathers, he walked from his home in Camden Town to the Museum, and even after his retirement he continued his daily exercise, enjoying excellent health. His friends hoped that he would reach his 100th year; he died on June 19, 1910, within four months of his 101st birthday.

His son, Edward Gerrard, and one daughter survive him. The former followed in his father's footsteps, being the well-known Agent of Natural History, who has done great services to the Museum by faithfully fulfilling numerous commissions with which he has been entrusted, and from whose laboratory the majority of the best-mounted mammals in the Museum have been issued. [Albert Günther.]

John Hinchley Hart, F.L.S., was born in 1847 and educated in England, but as early as 1872 he went to America, where in the British Colonies he found a rich field for his energy and his practical abilities. He spent the years 1872–75 as landscape-gardener in Nova Scotia, and the next twelve years in Jamaica, first in charge of the gardens and grounds of King's House, then as Superintendent of the Cinchona plantations (1881–86), and finally as Director of Public Gardens and Plantations. In 1887 he was appointed Superintendent of the Royal Botanic Gardens in Trinidad, which post he held until 1908, when he retired from Government service. He was regarded as one of the best and most trustworthy authorities in agriculture and horticulture in the West Indies, and had an extensive knowledge of the floras of Jamaica and Trinidad. His publications are few, but the Herbarium list of the botanical department of Trinidad (1908) is very useful. He also edited Jenman's volume of 'The Ferns and Fern Allies of the British West Indies and Guiana' (1909). He was elected a Fellow of this Society in 1887. [O. Stapf.]

Frederick Hovenden was a member of a firm of perfumers, and succeeded in securing the means of early retirement from business cares. Born in London in 1838, he soon took part in local work, and in 1874 became the principal mover in founding the South London Natural History Society (of which he became the first secretary) in conjunction with Henry Deane, Prof. Charles Stewart, Dr. Braithwaite, and others. On quitting business he moved from Brixton to Dulwich, and, later still, he acquired a country house near Swanage, attracted thither by the charm of the geology of the district.

He was elected Fellow, 5th June, 1873, and of the Geological Society in 1876; he died at Dulwich on the 17th March, 1911, being buried at Norwood. [B. D. J.]

Lieut.-Colonel Simpson Powell, M.D., R.A.M.C., died at Rangoon on the 23rd March, 1911, soon after he had returned to duty as senior medical officer from furlough, during which he had been elected a Fellow of the Linnean Society, on 1st December, 1910; his connection with us therefore lasting less than four months.

He was the eldest son of Mr. Christopher Bollared Powell, of Southborough, Kent; born in 1858, he was educated at Bury St. Edmunds School, and received his medical training at King's College, London, becoming house physician there. After taking the medical diplomas of L.S.A. and M.R.C.S. in 1880 and 1882 respectively, he graduated at Durham University M.B. in 1883 and M.D. in 1896. He entered the Army Medical Service in 1885, and thenceforward served in India, China, and the Home District. Gazetted Lieut.-Colonel in 1905, he sailed again for India in 1908, and was transferred to Burma, where his career was cut short by the climate. [B. D. J.]

Francis Lesitee Soper was, at the time of his death, 30th December, 1910, at Highgate, at the advanced age of 92, the head of the firm of scientific publishers Lovell Reeve & Co. He was a frequent attendant at the General Meetings of the Society till a few months before his death.

Like his predeceased partner, Mr. Lovell Reeve, he took a keen interest in the subjects of the volumes published by their house, but, unlike the senior partner, he did not join the ranks of authors.

He was elected Fellow of the Society, 1st December, 1870. [B. D. J.]

Samuel Alexander Stewart, A.L.S., was born in Philadelphia on February 5, 1826. When eleven years old he came with his father to live at Belfast, where he spent the remainder of his long life, dying on June 15, 1910, in consequence of an accident in the street. He was an entirely self-educated man. Poor health when a child, and then straitened circumstances, shut him out from the ordinary school career; but, fortunately, his love of nature took him early to the field where the work of his life was done. Up to 1880, when he was appointed Assistant-Curator of the Belfast Museum, he worked at trunk-making, a trade in which he was particularly skilful, giving all the spare hours to natural history, especially botany and geology. He was on the committee of the Belfast Naturalists' Field Club from its foundation in 1863, and his first paper, "On the occurrence of some rare or little known Plants in the Belfast district," was published the same year. A considerable number of other papers and notes on the botany, zoology, and geology, mainly of the North-East of Ireland, followed, his last contribution bearing the date 1909. But his principal work was the 'Flora of the North-East of Ireland'

(1888), of which Lloyd Praeger, a most competent judge, says, that "its fulness, accuracy, and scholarly style place it high among works of the kind." In 1891 he was appointed Curator of the Belfast Museum, which post he held until 1907. He was elected Associate of the Society in 1904. A list of his publications and further particulars of his life and achievements, as well as a portrait, were published in 'The Irish Naturalist,' vol. xix. (1910) pp. 201–209. [O. Stapf.]

By the death of Dr. Melchior Treub, at St. Raphael on the 3rd October, 1910, the Linnean Society has lost one of its most distinguished Foreign Members, and Botany one of its most able exponents.

He was born at Voorschoten, three miles S.W. of Leyden, on the 26th December, 1851; and soon showing his love for Natural Science, he devoted himself to its study at Leyden under Prof. W. F. R. Suringar, but early struck out into other directions than those usually then followed at that University. His dissertation 'Onderzoekingen over de natuur der lichenen,' Leiden, 1873, was upon the then burning question of the independent entity of Lichens, and Treub succeeded by cultures in showing that gonidia did not arise from hyphæ, a theory previously only tentatively advanced. For this he received a gold medal, and became assistant to Prof. Suringar. A small paper on the pappus of *Hieracium umbellatum* followed, where he observed, in a plant affected by galls, the altered flower-heads displayed 5-leaved calyces and other transitions, from which he concluded that the pappus arose from division of the calyx-segments.

'Iets over het Chlorophyll,' which came out in the following year, 1874, showed his powers in a new field, and one to which he recurred in later years when in Java; in this he specially dealt with the occurrence of red and green colouring-matter.

After this his writings were most often expressed in French, his mother's native tongue, beginning with 'Le meristème primitif de la racine dans les Monocotylédones,' 1876, and 'Recherches sur les organes de la végétation du *Selaginella Martensii*,' Leiden, 1877; and his first essay in cytology, 'Quelques recherches sur la rôle du noyau dans la division des cellules végétales,' Amsterdam, 1878, and in 1879 his observations on sclerenchyma and multinucleate cells, and 'Notes sur l'embryogénie de quelques Orchidées,' Amsterdam.

By this time his gifts and scientific industry had drawn attention to him; whilst still assistant to Suringar he was chosen a Member of the Dutch Academy of Sciences, and when R. H. C. C. Scheffer's death left the post of Director of the Botanic Gardens at Buitenzorg vacant, Treub was thought the best man for the place, though he was not at first disposed to accept it.

The Garden at Buitenzorg, founded in 1817 by Reinwardt,

and soon after rendered famous by C. L. Blume, had since fallen into neglect, but had been somewhat rehabilitated during the long service of Teysman, and the eleven years of directorship under Scheffer. The latter had started a department of Colonial Agriculture, and a scientific journal emanating from the garden, and restricted to systematic papers, under the title of 'Annales du jardin botanique de Buitenzorg.' Of this only the first volume was completed by Scheffer in 1876, when it stopped, until resumed by his successor.

In November 1880 Treub was settled at Buitenzorg, with Dr. W. Burck as his assistant, and soon determined that the 'Annales' should be continued on a wider basis, and not be confined to the concerns of Java. In the preface to the second volume of that series the new editor explained how that administrative duties had hindered his predecessor from prosecuting the work, but he considered it his pious duty to put forward the only paper found written by Scheffer, and that though his own work had hitherto lain in the departments of plant anatomy and physiology, he had no intention of confining the journal to one department. Besides the contribution already mentioned, Dr. Treub printed in this volume the first part of his 'Recherches sur les Cycadées' and 'Observations sur les Loranthacées.'

Treub may be considered as the first botanist, trained in modern methods, who has had the control of a botanic garden in the tropical wonderland: of this he made full use. Few botanists had used the microscope in the tropics: in India, Griffith had employed the instruments of his day to good purpose, it is true, but the new Director set himself to establish proper and adequate means of research, amidst the gorgeous and abundant vegetation surrounding his sphere of activity. He succeeded in making Buitenzorg a goal for visiting botanists, attracted thither by the prospect of employing material in abundance, quite unattainable in temperate climates, and he also succeeded in establishing the Agricultural Department on a scientific basis. With the administration of the garden and the department just mentioned, his energies, even in a climate which usually exhausts Europeans in a few years, were still further employed in a series of researches and observations which would have done credit to a man of leisure.

Prof. Goebel has pointed out that Treub's contributions to the 'Annales' may be grouped under four heads.

First, his observations on the prothallia of the Lycopodiaceæ, extending over four volumes. Second, the work on Cycads, *Casuarina*, the division of Angiosperms into chalazogamic and porogamic plants, and Apogamy. Third, on Epiphytes and *Myrmecodia*, on climbing plants, and the renewal of vegetation on Krakatau, tracing it from the third year after the eruption, with the occurrence of Cyanophyceæ as rendering possible the advent of Mosses and Ferns. Fourth, the continuation of his

researches on chlorophyll, and the presence of hydrocyanic acid in plants as the first product of nitrogenous assimilation.

At Buitenzorg he had established the 'Laboratoire des Savants étrangers'—what a wealth of meaning and of scientific hospitality is in that phrase,—and at Tjibodas, already famous as the early station for Cinchona culture in Java, he had a small mountain-garden established, with a laboratory in close connection with the virgin forest. At his instigation, the Government set apart a portion of the original forest, so that it might remain undisturbed.

Treub left Java in October 1909, hoping to spend the remainder of his life in Europe. He broke his journey at Cairo, and afterwards travelled to the Riviera. But after 29 years' service in Java, cooler regions did not restore his strength, and on the 3rd October, 1910, he breathed his last at St. Raphael. He was elected a Foreign Member, 5th May, 1887.

This brief sketch of a full and strenuous life gives no idea of Treub's charming personality. Even to those who met him only during his occasional visits to Europe he was a delightful companion, but to those who had the good fortune to visit him at Buitenzorg he was still more; he had a unique position, and used it wisely and well. We have lost a great man, of a character too rarely found, and the present generation may never again see his equal, but his memory will live with those who were fortunate enough to know him and to value his labours at their true worth.

A good portrait will be found in the 'Gardeners' Chronicle' for 5th November, 1910, p. 336, and a full bibliography by Prof. F. A. F. Went, in Ann. Jard. Bot. Buitenz. xxiv. (1911) pp. xxix–xxxii, preceding Treub's latest and posthumous essay.

[B. D. J.]

The Reverend Robert Boog Watson, LL.D., F.L.S., F.G.S., F.R.S.E. Born on September 26th, 1823, he was educated at the Edinburgh Academy and at Lille, and took his B.A. at Edinburgh University. After a course of study at the New College, Edinburgh, he was licensed by the Free Presbytery in 1847, and in 1854, on the outbreak of the Crimean War, he went out as Chaplain to the 93rd Highlanders. Invalided home after a nearly fatal attack of dysentery, he recovered sufficiently to undertake garrison work at Dover in 1856. In this year he married Janet Cowan, daughter of the founder of the firm of Alexander Cowan & Sons, papermakers, and immediately afterwards went out to India, and acted as Chaplain to the Highland Brigade in the Mutiny. Owing to a return of his illness, he was again invalided home.

In 1864 he accepted an appointment to the Scots' Church in Madeira, and in the course of his ten years' tenure of that office was enabled to investigate the remarkably rich land molluscan fauna of the Madeiran group, as well as the marine shells,

in co-operation with Lowe and Wollaston. On returning to Edinburgh, he devoted himself chiefly to his favourite sciences of geology and conchology; and in 1876, at the request of his friend, Sir Charles Wyville Thomson, he undertook to work out all the mollusca which had just been brought back by H.M.S. 'Challenger'—with the exception of the Cephalopoda and Pteropoda.

In 1878, however, the failure of the City of Glasgow Bank compelled him to give up his well-earned leisure and to return to work; and he accepted the call of the Free Church congregation at Cardross, Dumbartonshire, where he remained till his retirement from active work in 1898.

Residence in a country district of course deprived him of easy access to books and collections, and he therefore returned all the material he was working at to the 'Challenger' office; but Sir C. Wyville Thomson's urgent representations induced him to resume his studies in part, though he limited his investigations to the Gastropoda and Scaphopoda—about 1300 recognizable species in all.

The results of his labours appeared in the fifteenth volume of the 'Challenger' series in 1886, and, as an illustration of the thoroughness of his methods, it may be mentioned that he worked at the Museums of Paris, Berne, and Geneva, as well as at the British Museum, before the Natural History portion was removed to South Kensington.

In 1891 he was President of the Conchological Society, and in 1892 the University of Edinburgh conferred upon him the degree of LL.D.

Of the nature of Dr. Watson's work there is only one opinion. His descriptions, at times almost too detailed, are excellent, and he spared himself no trouble in their preparation.

For nearly twenty years he spent part of the summer in Switzerland, especially in the Rhone Valley, and his favourite haunt was Bel Alp, where he did much climbing and botanising, and fraternised with such men as Bishop Ellicot, Edward Whymper, and Prof. Tyndall.

[E. A. Smith, I.S.O., and J. R. Le B. Tomlin.]

[A list of nineteen works, nearly all on Mollusca, is given in Journ. of Conch. vol. xiii. pp. 139–40. Excluding the 'Challenger' monograph, the most important of these is the series on the 'Challenger' Mollusca in the Journ. Linn. Soc. (Zool.) xiv.–xvii. 1878–83.]

June 1st, 1911.

Dr. D. H. Scott, M.A., F.R.S., President, in the Chair.

The Minutes of the Anniversary Meeting of the 24th May, 1911, were read and confirmed.

Mr. Frederick Eyles, the Rev. Hilderic Friend, Mr. Ernest Lee, Miss Ann Cronin Halket, Mr. John Coney Moulton, Mr. John Graham Murray, Mr. Frederick John Freshwater Shaw, B.Sc., Mr. Charles Waterfall, and Mr. Malcolm Wilson, B.Sc., were elected Fellows.

The President announced that he had appointed the following as Vice-Presidents for the ensuing session :—Sir Frank Crisp, Mr. Horace W. Monckton, Prof. E. B. Poulton, and Dr. A. B. Rendle.

Prof. W. A. Herdman gave an account of the recent occurrence (April 1911) of the minute Dinoflagellate *Amphidinium operculatum*, Clap. & Lachm., at Port Erin in the Isle of Man, in such profusion as to discolour the sand between tide-marks in patches extending on some days for many yards. *Amphidinium operculatum* has been recorded from several places on the coasts of Europe and America, but has apparently not been previously found in Britain.

The Rev. T. R. R. Stebbing and Prof. Dendy contributed some remarks, and the author replied.

Dr. A. Smith Woodward gave a general account of the Fauna of the Carboniferous Period, so far as it has been discovered in the same deposits as the Carboniferous Flora. The Fauna agrees with the Flora in consisting for the most part of highly specialised representatives of the lower groups, but is singularly modern in some respects. Some of the freshwater and land Mollusca are scarcely distinguishable from genera still existing. All the Crustaceans are of primitive groups, and some of the most interesting are related to *Anaspides*, which still survives in Tasmania. The Myriapods, Scorpions, and Spiders are similar to those of later date, but a few of the Scorpions retain obvious remnants of the characters of their aquatic ancestors. Limuloids also occur. Insects are numerous, but all belong to the lower groups in which there is no complete metamorphosis, and there are many generalised types which can scarcely be referred to existing Orders. Cockroaches are numerous, but have transparent fore-wings. Primitive Dragon-flies occur, and some of these are the largest known insects, with a span of wings measuring 2 feet. Among Fishes, the spiny Acanthodian Sharks, which are typically Lower Palæozoic, are still found in the Carboniferous Fauna, and are known to have been preyed upon by the higher Fishes. The Pleuracanth

Sharks are characteristic of the period, and interesting as showing a more generalised vertebrate skeleton than any later Fishes. The Cochliodont Sharks with grinding teeth appear to be closely related to the existing *Cestracion*, but have many of the teeth fused into extensive plates. Some of the sharp-toothed Sharks also seem to have had their teeth fused into rigid masses. The highest Fishes are the Palæoniscids and Platysomids, which exhibit all the fundamental characters of the present-day Sturgeons, obscured beneath a normal covering of ganoid head-plates and scales. Large Dipnoan Fishes are numerous, and differ little from *Ceratodus*, except in showing traces of the separate points of which their dental plates are composed. Most important are the Crossopterygian Fishes, of which *Rhizodus* and *Megalichthys* are typical genera. These Fishes make a closer approach to the earliest lung-breathers than any Fishes which have existed before or since. Lung-breathers were certainly in existence just before the beginning of the Carboniferous Period, and all seem to belong to a very primitive group of Amphibia, variously termed Stegocephalia or Labyrinthodontia, in allusion to the complete roofing of their cheeks by bone and to the complicated structure of their teeth. In their possession of supra-temporal plates and often of post-temporal bones, as also in the marking of their superficial bones by the course of the slime-canals, these Amphibians more closely resemble fishes than any later members of the Order. Towards the end of the Carboniferous Period some of the smaller Stegocephalia, the so-called Microsauria, seem to have passed into true Reptiles very similar to the surviving *Sphenodon* or *Hatteria*.

A discussion followed, the undermentioned taking part:—The President, Mr. William Cash (visitor), the Rev. T. R. R. Stebbing, and Mr. A. O. Walker; the author replying.

June 15th, 1911.

Dr. A. B. Rendle, F.R.S., Vice-President, in the Chair

The Minutes of the General Meeting of the 1st June, 1911, were read and confirmed.

Mr. George Herbert Wailes, Miss Freda Bage, M.Sc., Mr. Malcolm Wilson, B.Sc., Miss Ann Cronin Halket, and Mr. Ernest Lee, B.Sc., were admitted Fellows.

Mr. William Neilson Jones, M.A. (Cantab.), was elected a Fellow.

A letter congratulating Sir Joseph Hooker on his approaching 94th birthday, was read and signed by the Chairman and the Fellows present.

Professor W. A. Herdman referred to his paper at the last meeting on the abundance of a *Peridinium* at Port Erin, and stated that he visited that locality a few days after the said meeting, and found similar markings on the sand, but on the latter occasion it was due to vast numbers of a Diatom, *Navicula Amphisbæna*.

Mr. G. H. Wailes, Prof. Dendy, and Mr. J. C. Shenstone contributed some remarks.

The following papers were read and discussed :—

1. Miss H. M. Cunnington.—The anatomy of *Enhalus acoroides*, Rich. (Communicated by Prof. Percy Groom, F.L.S.)
2. Prof. A. D. Imms.—On the life-history of *Croce filipennis*, Westw. (Communicated by Canon Fowler, F.L.S.)
3. Prof. J. J. Kieffer.—Cynipidæ.
4. The same.—Proctotrupoidea.
5. Prof. T. D. A. Cockerell.—Apoidea.
6. Mr. J. C. F. Fryer.—Lepidoptera.
7. Mr. G. Meade-Waldo.—Wasps.
8. Mr. J. E. Collin.—Borboridæ.
9. The same.—Phoridæ.
10. Mr. F. V. Theobald.—Culicidæ.

(The last eight papers, relating to the fauna of the Seychelles, were communicated by Prof. J. Stanley Gardiner, F.R.S., F.L.S.)

The first exhibition was by Mr. F. Enock, who showed a series of slides illustrating several species of the minute hymenopteron *Mymar*, especially the recently-discovered *M. regalis* from Burnham Beeches.

Dr. George Henderson, F.L.S., exhibited a lantern-slide, made from a snapshot of the head of a Waterbuck, *Cobus ellipsiprymnus*, taken by his son, Mr. Fred. L. Henderson, of the British East African Medical Service, at Nairobi.

Mr. W. Fawcett, F.L.S., showed :—

(*a*) A Parasitic Flowering Plant from Jamaica (*Scybalium jamaicense*, Schott & Endl.).

(*b*) Flowers of Banana (*Musa paradisiaca* var. *sapientum*).

The cultivated Banana-plant attains its full height before the flowers are formed. The trunk is a hollow cylinder formed by the bases of the leaf-stalks. The flowering-stalk first appears as a projection from the tuber into the base of the cylinder. The first flowers are formed while the stalk is quite short, and apparently it takes about six weeks for it to grow from the base until it emerges at the apex. The flowers exhibited were taken before emergence. They occur in clusters spirally arranged round the

peduncle. The lowest clusters are female flowers; the highest clusters are male flowers. Between these two sets of clusters there are very often a few clusters in which the ovary is about half the length of the whole flower; these are probably not truly hermaphrodite, but neuter.

The ovaries of the female flowers become the banana-fruit; those of the neuter flowers grow into small worthless fruit. The male flowers and bracts are deciduous, and the peduncle continues to lengthen and produce male flowers until the fruit is cut.

Dr. Stapf commented on these exhibitions.

Mrs. Longstaff showed a specimen of *Brassia caudata*, Lindl., in flower, from Jamaica, which was followed by remarks from Mr. W. Fawcett and the Chairman.

Sir Frank Crisp exhibited on behalf of Mr. William Morris a monstrous proliferation of a Foxglove, in which the terminal flower had attained an extraordinary development.

Mrs. Stebbing, F.L.S., also showed a very small monstrosity in the same species.

These exhibits were discussed by the Rev. T. R. R. Stebbing, Dr. Longstaff (visitor), Miss May Rathbone, and the Chairman.

ABSTRACTS.

I.

Alien Plants introduced into the Tweed District with Foreign Wool. By Ida M. Hayward, F.L.S.

[Read 1st December, 1910.]

The subject to which I propose briefly to direct the attention of this meeting is the Alien Plants of the Tweed district.

Those shown are a selection out of about 200 alien plants which I collected on the banks of the river Tweed and its tributary the Gala in the course of the last three or four years. Three of them were gathered when accompanied by Mr. James Fraser of Edinburgh, and two of them when accompanied by Mr. Claridge Druce of Oxford.

It is, however, proper to add that reference has been made to the major portion of them in the course of the present and past year in the 'Annals of Scottish Natural History' and the Botanical Exchange Club Report of the British Isles.

The reason of the plants being found on the banks of the Tweed and Gala is interesting. The staple industry in that locality is the manufacture of wool into cloth. The wool is brought from

the Colonies and various foreign countries, and in it is entangled a variety of seeds. In the process of washing the wool the seeds are swept into the river, and some of them, deposited on the shingle or on the banks of the river, germinate and grow into more or less hardy plants. In this way plants that are natives of Australia, New Zealand, Cape Colony, South America, and other foreign countries are seen to be growing side by side with plants of the British Flora.

Erodium Botrys, Bert. No. 1 specimen. A South European species.

There are a great many European species of *Erodium* by the river-banks and on mill waste-heaps.

Medicago præcox, DC. No. 2 specimen.

This genus, like the *Erodium*, is a very common one in the Tweed district. Eight different species have been collected; the species now exhibited, however, has not hitherto been recorded.

The history of this *Medicago* is interesting. Originally a South European species, it has become widely spread in Argentina. The Spaniards, in the sixteenth century, introduced into that country some of their domesticated sheep which probably carried some fruits of the *Medicago* with them. The seeds, finding there a congenial soil, have flourished and now come back to Europe and to the Tweedside in bales of wool. The fruits are also found in the wool of Australia and other colonies, and probably also have a similar origin.

The fruits, or burrs as they are locally called, are very detrimental to the wool. This, however, is overcome to some extent by the following process, which is now much practised in the manufacturing districts of this country and on the Continent. The rind of the burrs is carbonised by a weak solution of sulphuric acid, and then subjected to a dry heat of about 180 degrees. The burrs are then pulverised by heavy rollers and blown out by strong fans. The seeds themselves are uninjured by this process or even by being boiled in the process of dyeing.

Tillæa Vaillantii, Willd. Specimen No. 3. Native of France and Spain.

Plentiful for two successive years. It has stalked flowers and their parts are in fours, while in *Tillæa muscosa* the parts are in threes and the flower sessile.

The genus *Helipterum*, of which I have specimens of three different species, Nos. 6, 7, 8, *Helipterum corymbiflorum*, Schlecht., *Helipterum floribundum*, DC., *Helipterum hyalospermum*, F. von Mueller, is perhaps the most interesting of these alien plants. This genus has hitherto been unrecorded for Great Britain, and yet has been found growing as far north as the banks of the

Tweed. It is nearly allied to *Helichrysum*, an everlasting flower. *Helipterum* differs by having the hairs of the pappus *plumose* instead of *pilose*. Natives of South Africa and Australia.

Cotula australis, Hook. f. No. 9.

These I have found in plenty six miles down the river at Melrose for two successive years. It is a perennial, a native of Australia and New Zealand, invariably following sheep.

Cenia turbinata, Pers., var. *concolor*. No. 10.

In variety *concolor* the rays are yellow on both sides, in the type they are white above and red on the lower surface. An hitherto unrecorded genus for Britain, but a common weed throughout Cape Colony.

Senecio lautus, Forster. No. 11.

I have noticed *Senecio lautus* for three years. It is a handsome perennial plant and grows in abundance on the banks of the Gala and Tweed to a height of 2 feet. A native of Australia, Tasmania, and New Zealand.

Eritrichium australasicum, A. DC. No. 13.

One small patch of the above endemic Australian species was found in moist alluvium near the junction of the Gala and Tweed, and was an unrecorded genus for Britain.

Atriplex spongiosa, F. von Mueller. No. 14.

The berry-like spongy fruit of plants found at Tweedside turned from pale green to dull red. I have noticed the testa comes off, leaving the inner membrane with ripe seeds. It may be at this stage the seeds adhere to the wool. Sheep are very fond of *Atriplex spongiosa*: Maiden, in his 'Useful Plants of Australia,' tells us "it is a useful salt bush for culture." It may be found through a great part of Central Australia, extending to the West Coast and also South Australia.

Deyeuxia retrofracta (Willd.), Druce. No. 18.

This very common, but variable Australian species is referred to by Maiden as Toothed Bent Grass. It produces a large quantity of sweet fodder in damp localities and is valuable for pastures. It is essentially a winter grass, dying out on the approach of summer, and is eaten when young. Its pointed seeds are very injurious to wool. It seeds in September and October.

The remaining specimens exhibited are:—

Daucus brachiatus, Sieber. No. 4. A native of Australia.

Erigeron linifolius, Willd. No. 5. A native of Australia, South America, common in China and Ceylon.

Senecio brachyglossus, F. von Mueller. A native of Australia.

Rumex Brownii, Camp. No. 15. A native of Australia and said to thrive in every place where sheep have been *. I have found it growing for three years in abundance by the banks of the Gala and Tweed.

Agrostis lachnantha, Nees. No. 16. A native of South Africa and Abyssinia.

Polypogon linearis, Trin. No. 17. A Chilian species.

I have to accord my warmest thanks to the authorities of the Herbaria of Kew and the British Museum, to Mr. G. Claridge Druce, to Prof. Bayley Balfour, and Mr. James Fraser of Edinburgh, for kindly helping to name and verify these plants.

II.

Reports on the International Congress of Botanists, held at Brussels in May 1910.

[Presented 15th December, 1910.]

Dr. O. Stapf introduced his report on the International Botanical Congress, held at Brussels between May 14–22 of the present year, with a short account of the working programme of the Congress as it arose out of the decisions of the last International Botanical Congress which met at Vienna in 1905 and the dispositions of the Belgian Bureau. There were altogether 5 sections. Sections I. and II. were charged with the discussion and codification of the special arrangements necessary with respect to the nomenclature of fossil and non-vascular plants on account of their special nature. Tacked on to them were two propositions dealing with an extension of the list of '*nomina conservanda*' for phanerogams and vascular cryptogams, adopted at Vienna. Section III. was reserved to 'phytogeographical nomenclature.' Section IV. was to deal with bibliography and botanical documentation, and Section V. with botanical instruction. Sections I. and II. continued the work of the Vienna Congress in so far as it concerned nomenclature. Section III. was the result of the deliberations of a new Commission appointed by the Vienna Congress. The other two sections were added by the Belgian Bureau.

The Linnean Society appointed five delegates for the Congress with a view to have the different departments concerned in the discussion on taxonomic nomenclature as far as possible represented. The delegates were Messrs. Arber (fossil plants), Cotton (Algæ, Lichens, and Fungi), Gepp (Musci and Hepaticæ), Henry Groves and Dr. Stapf (Phanerogams and Vascular Cryptogams,

* Bentham, 'Flora of Australia,' vol. v. p. 263.

and Mr. H. Groves, the latter also for Characeæ). Phytogeography was not taken especially into account, as Mr. Tansley, the delegate of the Cambridge Philosophical Society, joined Section III. As to Sections IV. and V. no special steps were taken, and as their meetings mostly coincided in time with those of Sections I., II., and III., the delegates of the Society did not take part in their deliberations.

Dr. Stapf reported then especially on the decisions concerning the nomenclature of phanerogams and vascular cryptogams. A number of propositions of a general character, and insofar touching the nomenclature of phanerogams and vascular cryptogams, had been submitted to the Permanent Bureau on Nomenclature, but they were automatically cut out by the decision of the Bureau not to reopen the discussion on points decided at Vienna. Thus the only serious subject to decide upon was the question whether and to what extent the list of '*nomina conservanda*' was to be added to. There were two lists of addenda proposed—one of phanerogamic genera, the other of fern genera and fern allies. The object of their promoters was to restrict as far as possible the replacement of well-known and generally used names by obscure ones on the ground of the strict application of the rule of priority. As in certain cases the changes had already been made since 1905 and they had found their way into floras and text-books, a compromise was accepted by which those changes were recognised, but further changes barred by putting a considerable number of threatened genera on the list of '*nomina conservanda*.' Among the names thus saved were, for instance, *Persea* and *Terminalia*, genera including a great many species, and *Welwitschia* and *Selaginella*.

Mr. Henry Groves followed with some remarks on the question of taxonomy as affecting local floras, and the fact that little had to be altered in Characeæ. He also paid a warm tribute to the masterly manner in which Dr. Briquet discharged his duties as 'Rapporteur général.'

Mr. A. Gepp reported thus :—

In contributing to the report on the International Congress of Botanists at Brussels, I beg to express my thanks to the Society for the honour they conferred upon me by including me among their delegates. The Congress was attended by many distinguished botanists, whom it was a pleasure to see, and whom otherwise one might never come across.

The work of the Congress covered a very wide field, but owing to the thorough carefulness with which the matters for discussion had been sifted and prepared beforehand by the permanent Committee, and to the diligence and determination of the honorary presidents, vice-presidents, and secretaries, the agenda were carried through and settled point by point with business-like celerity at the meetings.

Though interested in the welfare of the Cryptogams as a whole, I was specially interested in the nomenclature of the Algæ, Mosses, Hepatics, and Ferns. The points to be settled by the Congress were these:—Whether the nomenclature of the Cellular Cryptogams would start from Linnæus's 'Species Plantarum,' Edition I. (1753), thus bringing them into line with the Vascular Plants, which occupied the attention of the Vienna Congress in 1905; or whether the various groups of Cryptogams should have separate starting-points of later date. In the event it was decided that some of the groups should date from Linnæus's 'Species Plantarum' (1753), viz.:—Myxomycetes, Lichenes, Hepaticæ, Sphagnaceæ, and the main group of the Algæ. On the other hand, the Fungi are to start partly from Fries's 'Systema Mycologicum' (1821–32), and partly from Persoon's 'Synopsis Fungorum' (1801). The remainder of the Algæ, broken up into small groups, are to start from various dates, and some are left over for consideration at the next Congress (London, 1915). The Mosses (Musci veri) are to date from Hedwig's 'Species Muscorum' (1801).

The reason for selecting works of post-Linnean date as starting-points for some of the groups of Cryptogams is that there is considerable doubt as to what plants Linnæus meant by the names and descriptions in his 'Species Plantarum.' It sometimes happens, for instance, that his description represents one species, while the plate cited figures another species, and the specimen found in his herbarium is a third and different species.

It was to avoid basing the Mosses upon such uncertain types that the proposal was made to select Hedwig's 'Species Muscorum' (1801) as starting-point for the Musci veri. For Hedwig was the first to discern generic values and relationships among the Mosses, and to investigate and figure their morphology with a microscope (a primitive one though it was). His 'Species Muscorum' is an epitome of his previous works; and his type-specimens are still in existence.

Similarly, it would have been well to make the Hepaticæ and Lichenes start, not from Linnæus's 'Species Plantarum' (1753), where, indeed, they are included under the Algæ, but from the works of some post-Linnean specialists. For instance, Sir William J. Hooker's 'British Jungermanniæ' (1812–16) is the real starting-point of hepaticology, and only fails to qualify through not treating of the Marchantiaceæ, Ricciaceæ, Anthocerotaceæ. And for the Lichenes the book that suggests itself is Acharius's 'Lichenographia Universalis' (1810). The types of these two authors are either in existence or for the most part are comprehensible. But in the absence of any definite proposal, the Congress could hardly do otherwise than leave the Hepaticæ and Lichenes on the Linnean starting-line. In the case of the Algæ, the proposals for giving the main group a less antiquated starting-point were defeated.

However, the actual starting-point may perhaps not be of vital

importance; for the Congress made the wise provision of appointing for each group of Cryptogams a special Committee, whose duty it is to prepare and consider lists of '*nomina conservanda*' to be submitted to the next Congress (London, 1915). This should put the nomenclature of the various groups upon a satisfactory and stable basis, and will give an opportunity for eliminating undesirable factors, as, for example, the name *Jungermannia*, which in Linnæus's 'Species Plantarum' represents, not a genus, but a whole family of heterogeneous genera. *Jungermannia* can be discarded, just as *Lichen*, as a genus-name, has been long discarded by universal consent.

A word now as to the Ferns and Fern-allies. These, as decided at the Vienna Congress (1905), start from Linnæus's 'Species Plantarum.' An attempt was made at the recent Brussels Congress to establish a list of '*nomina conservanda*' for some twelve genera of ferns which otherwise will pass out of use: the most interesting of these are *Nephrodium* and *Selaginella*. The proposal was, however, rejected by a strong opposition on the plea of practical convenience; for a complete and appropriate scheme of fern-nomenclature has been carefully elaborated by Christensen in his 'Index Filicum' (1905 6), a book that is everywhere accepted and is in full accord with the laws of priority. Let it be the standard, and there will be no more wrangling over fern-names. It should be added, however, that the Congress decided to maintain the name *Selaginella* in place of *Stachygynandrum* and other earlier synonyms. Further, it is interesting to note about *Nephrodium*, that upon its acceptance or rejection depended the fate of some 800 species. These have now been transferred by Christensen and others to *Dryopteris*, a genus which however does not deserve its position. For recently it has been pointed out by Niewland in the 'American Midland Naturalist' that Schmidel in his 'Icones Plantarum' employed the name *Thelypteris* for the same group of ferns a year before Adanson proposed *Dryopteris*, and that Schmidel has given in illustration an unmistakable figure of the Marsh-fern (*Nephrodium Thelypteris*). It would appear, then, that the 800 species will now have to be transferred to *Thelypteris*, unless *Dryopteris* should be put among the '*genera conservanda*.'

Mr. A. D. Cotton then explained that the following dates were adopted as the starting-points for the nomenclature of the Cellular Cryptogams:—

Algæ.

Linnæus, Species Plantarum, 1753; with the following exceptions:—

Desmidiaceæ. Ralfs, British Desmidiaceæ, 1848.
Oedogoniaceæ. Hirn, Monographie der Oedogoniaceen, 1900.

Cyanophyceæ. Bornet & Flahault, Revision des Nostocacées hétérocystées, 1886–8; and Gomont, Monographie des Oscillariées (Nostocacées homocystées), 1892–3.

Diatomaceæ, Chroöcoccaceæ, and Flagellateæ were postponed till the next Congress.

FUNGI.

Fries, Systema Mycologicum, 1821–1832; with the following exceptions:—

Uredineæ, Ustilagineæ, and Gasteromycetes, which start from Persoon, Synopsis Fungorum, 1801.

LICHENS.

Linnæus, Species Plantarum, 1753.

MYXOMYCETES.

Linnæus, Species Plantarum, 1753.

Committees were appointed to prepare lists of '*genera conservanda*' for the Algæ, Fungi, and Lichens.

For Fungi with a pleomorphic life-cycle, it was decided to adopt the oldest name applied to the perfect stage of the fungus, provided that in other respects it conform to the rules.

Mr. E. A. N. ARBER not being present, and no delegate having been present at the Section on Phytogeographical Nomenclature (admirably summarised in the 'New Phytologist,' ix. nos. 6 & 7, pp. 260–262), Dr. Stapf resumed his address, stating that:—

The propositions concerning fossil plants led in one particular point to a somewhat lively discussion. This was with respect to the admission of diagnoses or descriptions not in Latin, but in one of the four modern tongues, English, French, German, or Italian. It was in the end decided that descriptions of fossil plants might be in a modern language, but they should always be accompanied by a Latin diagnosis. As starting-point Linnæus's 'Species Plantarum,' 1753, was adopted for fossil plants; but in order to reduce the changes arising from that rule to a minimum, a list of '*nomina conservanda*' will have to be drawn up, including generic names of living plants which otherwise—as, for instance, *Bucklandia*—would have to give way to old generic names of fossil plants, and generic names of fossil plants which are homonyms of synonyms of recent plants.

III.

2nd February, 1911.

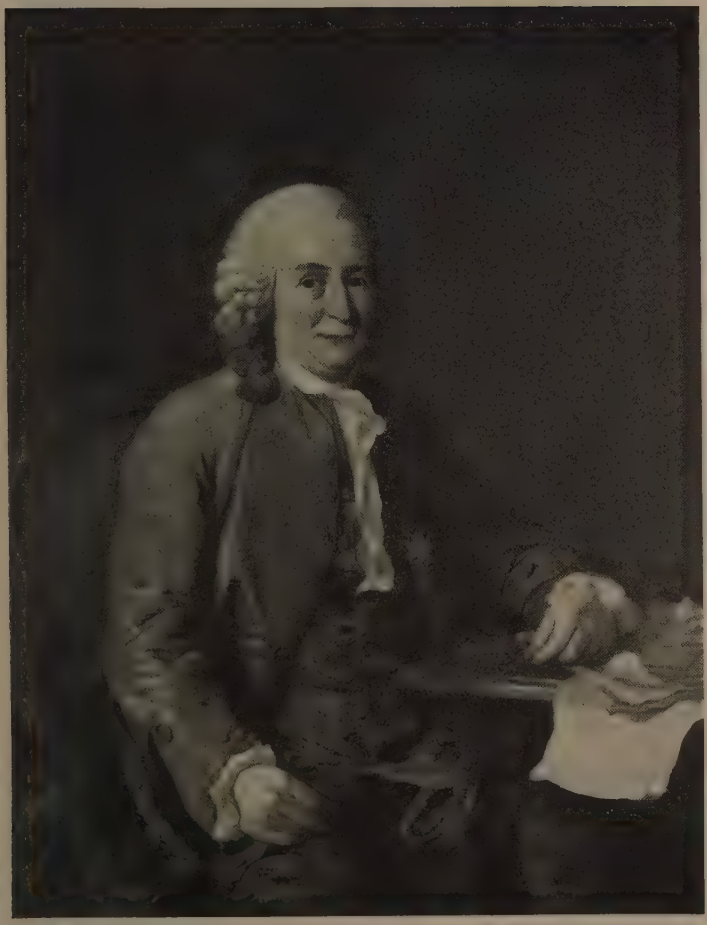
(*a*)

The General Secretary, Dr. B. Daydon Jackson, gave the following history of the portrait of Carl von Linné painted by Alexander Roslin, with some further remarks on the Lapland drum in the Hoffman portrait.

He pointed out that there are three portraits of the great Swede known to be painted by Roslin, two of them busts and one a three-quarter length. They have been termed by Prof. Tycho Tullberg, the iconographer of Linné, (1) the Stockholm, (2) the Gripsholm, and (3) the Versailles portraits; nos. 1 and 2 respectively form plates 13 and 12 of Tullberg's 'Linnéporträtt' and are excellently reproduced; no. 3 in the same work is a half-tone reproduction which leaves much to be desired. He had, therefore, after much trouble and delay succeeded in getting a fresh photograph taken (Plate), and accompanied it with the following account of its origin, so far as now ascertainable.

Linné in his 'Egenh. Anteck.' p. 68, says:—"Herr Roslin who takes 1000 plâtar (about £165) of others, is doing Linné's portrait gratis and so excellently that nothing can be more like; all the others are somewhat unlike." In a letter to his intimate friend Bäck at Stockholm, Linné says:—"Will my brother [*i. e.* Bäck] should he meet Roslin, who has not his equal in the world, be so good as to ask when I should come? Think how extremely generous he was to promise to paint my head gratis, though he charges from 7000 to 8000 dalers (about £160 to £182) for each portrait, and that he promised me the first time I had the fortune to meet him. God grant that he may not repent. It would be a reason for me once more during life to see Stockholm." This letter is undated, but Prof. Fries states it was certainly written in November 1774 (see Bref och Skrifv. v. p. 222). In a later letter, of the 18th November, he continues, "My colleagues want to have me with them in Stockholm, when they will present the first book of their Bible version, but lectures, presidency, cold winds, and old age prevent me, though I should like to come, if Roslin the great portrait painter has time to do me the favour he has so kindly promised" (Ib. p. 223); and four days later, "If I keep well, I will come to Stockholm to enjoy the signal and valuable favour our great Roslin offered me so innocently" (Ib. p. 224).

It is certain that Linné journeyed to Stockholm, probably a few months later, in 1775, when the portrait was painted. Which of the three portraits specified above was the original is not easy to decide, for Roslin took it with him to Paris. At the beginning he evidently did not contemplate this, but on so deciding he applied to the secretary of the Royal Academy of Science, P. Wargentin, who seems to have taken Linné's opinion upon the



CARL VON LINNÉ.

project, for Linné replies to Wargentin, 17th Sept., 1775: "Through my being at Hammarby I only received the post to-day. Herr Roslin has done the portrait gratis, so that he was at liberty to dispose of it, even without my wish, but he has thereby done me double favour, for it was only painted for posterity, and can never be better copied than in Paris; give him my respectful thanks, if he is still [in Stockholm] and say that I am doubly indebted to him." This letter shows that the reason why Roslin wanted to carry off the portrait, was to copy it in Paris, where he was permanently settled.

It is perfectly certain that the portrait which now belongs to the Versailles gallery was painted complete in Sweden, for it was very accurately copied by Lorenz Pasch the younger; and as he seems never to have left Sweden after his return from abroad in 1766, the copy must have been made in that country, so that Roslin's original must have been then complete.

Nothing more was heard about the portrait till after Linné's death early in 1778, and the news seems to have stirred Roslin up to carry out his promise to give a copy to the family of Linné and to the Royal Academy of Science. In September of that year, the Academy debated upon some talk which the painter had with some of the members, that he was to get one of the most skilful of the Paris engravers to engrave the portrait of his fellow-countryman which he had painted. It was to cost 1000 livres (£39 15*s.* 0*d.*), and Roslin asked whether the Academy would pay this on condition of receiving the plate and the whole of the impression, which it was thought would readily sell, and be eagerly sought after by the whole of the learned world, so that not only would the outlay be recouped, but that the Academy would benefit. The Academy took this view gladly and gave instructions to the Secretary accordingly. A letter of the 12th May, 1779, from Roslin was read in the meeting of the 2nd June, in which he stated, that the copper was now ready with 500 copies printed, and 150 of these were sent by Herr Sergel [the Swedish sculptor]. The remainder might be sold in Paris and elsewhere for 2 livres (=1*s.* 7*d.*) apiece. Besides the cost of the plate, 86 livres [=£3] had been spent for paper and printing. "The actual portrait which Herr Roslin made for himself, he offers to present to the Academy. All this delighted the Academy, but the determination as to the disposal of the 150 copies was postponed, till they should arrive." In a letter to the younger Linné dated 19th July, 1779, Wargentin says:—"Of the late Hr. Archiater's portrait engraved on copper, 150 copies have come. It is extraordinarily beautiful, and like, although the Archiater is represented younger and plumper than he was during the last years. It has cost the Academy 3600 dalers in copper (about £83)." This refers to Bervic's engraving, a copy of which was shown at the meeting held on the 21st July: "All present found it extremely well done, but were of various opinions as to the more or less likeness to our lamented Linné. The Academy decided to present copies to the widow and

son, Hr. Bäck and Hr. Sergel, but that the rest should be sold to the members and others at half a Riksdaler apiece (about 2*s.* 3*d.*)." On the same occasion a letter from Roslin was read, in which he offered the portrait itself. "The Secretary received instructions to thank him in the choicest language for this offer, which had been received by the Academy with the greatest pleasure."

As soon as the younger Linné received the print, he wrote to Wargentin:—"I thank you most obediently for the specimen of my late father's portrait, of which I have given my mother hers. It is extremely beautiful and well engraved; it is a pity that it appears so filled out, otherwise it would probably have been more like. Each time I look at it, at the first moment it seems wholly like, but that disappears directly I look longer at it. What about the Roslin portrait? Can it be got back? It would be most suitable if it were in the same building [the University] where both the Rudbecks were formerly."

When this was written the writer was probably unaware that a canvas had already been given to the Academy, and the picture he asked about was that which Roslin took with him to Paris. In a later letter, also to Wargentin, he says:—"That my late father's portrait has been given by Roslin to the Royal Academy, I can never say anything against, but am thereat extremely pleased." From this it would seem that the younger Linné, when he heard that Roslin had presented a portrait to the Academy, and when he did not get back that which Roslin carried off, thought the latter should hang in the University, for he could not object to another portrait being given to the Academy, of which, it must be remembered, Linné was one of the founders, its first president, and for 20 years its secretary.

As regards the three Roslin canvases, Prof. Tullberg comes to the following conclusion:—Roslin offered Linné when he met him to paint his portrait gratuitously for his own sake, possibly also with an idea of painting a replica to exhibit in Paris. He then painted the three-quarter length, which Linné saw and admired. Afterwards the idea just alluded to took a more definite shape, and as during his visit to Sweden he was unable to make the copy, he took it with him to Paris after getting Linné's permission. There it remained and nothing was done, and only after Linné's death in January 1778, did he begin to think about it. Roslin therefore did not trouble to paint a complete replica, but kept the original and pleased himself by painting a head-and-shoulders, which he suggested to the R. Academy should be engraved, a suggestion gladly received. It was this which he gave to the Academy; the latter, knowing that Roslin had promised the portrait to Linné, asked his son if he had any objection to the Academy accepting it, upon which he replied, that he "was very pleased therewith." Roslin, however, considered he was bound to carry out the promise made to Linné, and therefore painted the "Gripsholm" portrait for the family. It belonged to them until it was bought by Gustaf III. and placed in the palace of Gripsholm, but when, it is uncertain,

though it must have been before 1792, when he was assassinated by Ankarström. It cannot be maintained that this is a mere copy of the upper part of the Versailles portrait, for the position of the shoulders varies, the coat is of velvet, not silk, the necktie has another form, and a spray of *Linnæa* is placed in the button-hole, instead of the hand, which does not appear in the smaller canvas. In general the latter agrees with the Stockholm portrait: it seems probable that the Gripsholm portrait was painted first, possibly as a sketch; it might have been done in Sweden, or after the painter's return to Paris.

It may therefore be assumed that the Versailles portrait was painted in Sweden, and is the original picture; it was copied by Pasch very soon afterwards, and disappeared from sight after being exhibited at the Salon, till its reappearance fifty years ago. It is possible that the Gripsholm portrait was painted also in Sweden, but the Stockholm picture must certainly have been produced in Paris at a later period.

As the Versailles portrait is practically unknown in this country, the following details are taken from Prof. Tullberg's volume. It was shown at the Salon in Paris in 1779, and came by purchase to Versailles before 1861, and is numbered 4514. It has suffered bad treatment, and was restored some years since. When it was being cleaned, it was discovered that the painting bore traces of the cross of the Polar Star, which had previously escaped notice, and since then it has been very unhappily painted in, the crown being omitted, and the cross placed flat on the ribbon, instead of the true method of suspension. This explains why, in a series of photographs issued in 1897, the decoration is wanting; but it was present in 1906, as shown in a later photograph possessed by Prof. Tullberg.

The account given by Dr. W. Carruthers in our 'Proceedings,' 1905-6, pp. 67–68, set out the facts then available regarding the Pasch copy, but more recent information has rendered that account somewhat incorrect, as may be inferred from the foregoing narrative. It may be restated thus:—

Uno von Troil (1746–1803) was the son of an archbishop of Upsala, who, after taking his degree as *Philosophiæ Magister*, went on a foreign tour, during which he accompanied Sir Joseph Banks and Dr. Solander to Iceland, in 1770, and on his return to Sweden published his 'Bref rörande en resa till Island,' which aroused great attention. He met Roslin in Paris in 1771, and was therefore an acquaintance of the painter when he revisited his native country in 1774–5. Von Troil became a court-chaplain in 1775, and it seems practically certain that he then induced Roslin to allow Pasch to make a copy of what we have termed the Versailles portrait as a present to Sir Joseph Banks. It remained in Banks's possession till his death in 1820, when it passed to Robert Brown, under the proviso of Banks's will, that the household furniture in the Soho Square establishment should pass to Brown, upon Lady Banks ceasing to reside there after her husband's death. Brown

was President of the Linnean Society from 1849 to 1853, and upon his retiring from the Chair, he presented the Pasch copy of the Linnean portrait to the Society.

(*b*)

In the second and more detailed account given by Mr. (now Dr.) William Carruthers * of the various portraits known of Linné, he has recorded his belief that the frontispiece to the 'Flora lapponica' represents the author himself, with a Lapland drum on his knees, which, it is suggested, is a press for drying plants (Proc. 1905–6, p. 60). I am myself forced to regard the whole frontispiece as representing the country and its inhabitants, some of the objects as drawn by Linné, others, such as the mountains, as imagined by the Dutch artist. The figure in the foreground is a Lapp in front of his tent, with the magic drum on his knees, some small stones on the stretched skin, and a forked instrument to set the membrane in vibration and cause the stones to move on to certain representations of deities and objects of every-day life, by which the future might be forecast. These drums were formerly common amongst the Lapps, but the Swedish missionaries discouraged their preservation as savouring of superstition, and large numbers were destroyed. The ultimate fate of Linné's specimen seems unknown; he had it with him in Amsterdam, when the full-length canvas was painted by M. Hoffman.

Prof. Tullberg, on the authority of Prof. K. B. Wiklund, has given in his 'Linnéporträtt,' p. 92, the following explanation of the designs drawn upon the drum in the Hoffman portrait, as also the text-figure here reproduced, slightly reduced in size. The

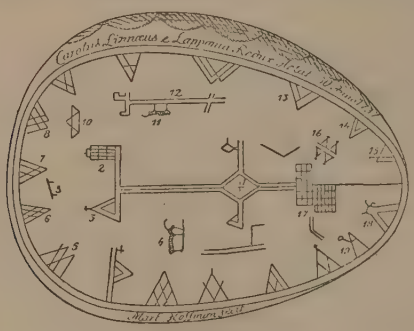


Fig. 39.

drum consisted of an oval frame of wood over which was stretched a skin, upon which many figures were drawn; it was used by the Lapps to search out hidden matters, which was done by placing stones or other small objects on the drum-skin, which was then thrown into vibration by means of a fork-like instrument, which

* Proc. Linn. Soc. 1905–6, p. 60.

was called the hammer. Naturally the objects on the membrane changed places on the skin, and by their incidence upon the respective figures, the future was foretold. The figures on the drum are thus identified:—

1. The sun with its beams in four directions, 2. Reindeer paddock (?), 3. Lapp tent, 4. Reindeer, 5–8. Deities, 9. The sacrifice, 10. Boat, 11. Reindeer, 12. Road to peasant's cottage, 13–15. Lapp divinities or norns. 16. Road with 4 human figures, 17. Reindeer enclosure (?), 18. The kingdom of the dead, 19. Magician with drum.

The remainder of the picture shows other Lapps hunting, boating, driving in reindeer sleighs, with the sun in its course visible throughout the entire twenty-four hours, and apparently about 3 A.M. judging from its position, a Lapp storehouse on poles, and sundry other indications of their wandering life.

IV.

March 2, 16, and May 4, 1911.

The terms Polyzoa and Bryozoa.

(*a*)

The Rev. T. R. R. Stebbing made the following remarks:—Like the suit of Jarndyce *v.* Jarndyce, the controversy between the terms Polyzoa and Bryozoa seems almost interminable. An attempt to settle it ought to be welcome. For this purpose it is desirable to confront the arguments on each side.

The late Mr. Busk, in his monograph of the Crag Polyzoa, 1859, after mentioning that Milne-Edwards had proposed to distinguish this group from the hydroid polyps by the name of 'Polypes tuniciers,' goes on to say:—"Another independent observer, however, Dr. John V. Thompson, of Cork, was also at work on the same subject, the results of whose researches, apparently commenced in 1820, were not published till December 1830, in the first part of his 'Zoological Researches and Illustrations.' He, like M. Milne-Edwards, recognising the close affinities presented in the structure of the animals to that of the compound Ascidians, was the first to propose for them an appellation wholly independent of their former incongruous allies, the hydroid 'Polypes.' The term he employed was 'Polyzoa,' it 'being applied,' as he says, 'to a distinct class of Polypes hitherto in great measure confounded with the Hydroida.' But it is to be remarked that he used the word in the singular number, so that the plural term, 'Polyzoa,' as now employed, though etymologically more correct, is not in reality synonymous with that of Dr. J. V. Thompson. This fact, which appears to have been strangely overlooked till 1852, may fairly enough be used as an argument in their favour by those who are inclined to prefer the Ehrenbergian term 'Bryozoa.' But as this preference, which is still extensively prevalent, more especially on the Continent, is based simply on the supposed priority of Professor Ehrenberg's appellation,

a claim which has been shown to be wholly untenable, it is scarcely likely that British naturalists will refuse the honour justly due to Dr. J. V. Thompson, for what can scarcely perhaps be regarded as a sufficient reason."

In a footnote Busk refers to his own article "On the Priority of the Term 'Polyzoa' for the Ascidian Polypes" (Ann. Nat. Hist. 2nd series, vol. x. p. 352, 1852). He there convincingly shows that December 1830 (date of Polyzoa) is earlier than March 1831 (first mention of Bryozoa). But he is apparently unaware how the importance of this undeniable fact is undermined by other considerations.

J. Vaughan Thompson was a man of renown who dimmed the lustre of his researches by his confused manner of expounding them. The fifth memoir of his 'Zoological Researches,' which is here in question, is entitled "On Polyzoa, a new animal discovered as an inhabitant of some Zoophites, with a description of the newly instituted Genera of *Pedicellaria* and *Vesicularia*."

At p. 94, Thompson says:—"This new animal, the Polyzoa, was subsequently found in *Sertularia Cuscuta*, *Spinosa*, and *Pustulosa*."

At p. 96, he says:—"The discovery of the Polyzoa was made in the summer of 1820; during the subsequent and following seasons, an exactly similar structure was noticed in the other species above enumerated, and in a new type which perhaps merits to be distinguished as a separate genus, under the title of *Pedicellaria*."

It thus appears that Polyzoa and Bryozoa are not really comparable, the latter being of ordinal and the former of generic value. Now, according to Scudder's 'Nomenclator Zoologicus,' Polyzoa was instituted by Lesson as a molluscan genus in 1830, while, according to Cuvier's 'Règne Animal,' vol. iii. p. 385 (1830), Lesson's 'Manuel de l'Hist. des Mollusques' was in fact published in 1829, so that Thompson's Polyzoa, published in December 1830, was void by preoccupation.

(*b*)

Note on J. V. Thompson's use of the term "Polyzoa."

By Prof. W. A. Herdman, F.R.S., F.L.S.

I have read with much interest the report of the remarks made by the Rev. T. R. R. Stebbing, at the last meeting of the Society, in regard to the use of the term "Polyzoa" in the title of one of the papers then communicated to the meeting. There are several distinct points that can be raised in the controversy as to the use of the terms "Bryozoa" and "Polyzoa." The only one that I desire to remark upon now is Mr. Stebbing's contention that Dr. J. Vaughan Thompson, in his publication of December, 1830, intended to use the term "Polyzoa" as a generic title, and that as such the name was pre-occupied by Lesson's institution of a Molluscan genus in 1829. I am sorry that an examination of J. V. Thompson's 5th Memoir, in the 4th part of his 'Zoological Researches and Illustrations,' leaves me unable to agree with Mr. Stebbing that Thompson used "Polyzoa" as a generic name. Several passages in the memoir seem to me to show clearly that

the author was arguing that sets of species included under several different genera, and even distinct families, had the structure which he was describing under the term "Polyzoa" and, therefore, ought to be removed from the groups with which they had previously been associated. For example, after saying that some of the Sertularian Zoophytes would require to be so removed, "as well as such *other genera* [italics mine] as may hereafter be found similarly circumstanced," he goes on (Mem. 5, p. 92) to say:—"I shall merely indicate here in a general way the whole of the Flustraceæ, in many of which I have clearly ascertained the animals to be Polyzoæ." Surely this indicates that he recognised that whole families and genera would find their proper places in his new group?

Then again, on page 97, he refers some of the species of "Sertularia" (which, by the way, from another passage he evidently regards as a "Family"), in which he has found the animals to be Polyzoa, "to *one* genus"; but that does not mean one genus "Polyzoa," for, a few lines below, he proposes the name "Vesicularia" for this genus, showing clearly that he did *not* regard his term "Polyzoa" as a generic title, and that *Vesicularia* was only one set of species in the larger assemblage Polyzoa which he was creating. Thompson was in the habit of printing a generic name at the foot of each of his plates—such as Nebalia, Noctiluca, etc., in previous Parts of his 'Zoological Researches,'—and below the plates of this "Polyzoa" memoir we find the name "Vesicularia," as one would expect from the text. It is clear then, on all these grounds, that he did not regard "Polyzoa" as a genus.

Finally, in the last paragraph of this paper (p. 100) he says:—"Time and more accurate observations will no doubt add many more species to the above genera, etc." That is, genera of which he had demonstrated the Polyzoon structure or nature. It is therefore obvious that he could not and did not regard the whole assemblage of such genera as one genus to which he was applying the term "Polyzoa," as Mr. Stebbing would apparently have us believe.

In short, I consider that John Vaughan Thompson knew what he was about, and that although in places his language is a little quaint his meaning is clear: that he was the first to recognise the essential points in Polyzoon structure, as seen, for example, in the genus *Vesicularia*, or in the larger group "Flustracea," and that he described and figured these adequately in December, 1830, in a memoir entitled "On Polyzoa," etc. The very title of his memoir shows that he did not put Polyzoa forward as the name of a genus, since it cites *Pedicellaria* and *Vesicularia* as the two new genera he is placing in the larger group Polyzoa. Is that clear recognition and demonstration of a group of allied genera collectively named "Polyzoa" invalidated by the fact that Lesson a few months before applied the term Polyzoa to a genus of Tunicata?

March 11th, 1911. W. A. Herdman.

(c)

On John Vaughan Thompson and his Polyzoa, and on *Vaunthompsonia*, a genus of Sympoda. By the Rev. T. R. R. Stebbing, M.A., F.R.S., F.L.S.

John Vaughan Thompson was born in 1779 and died in 1847. The Linnean Society with prophetic instinct elected him a Fellow on February 6th, 1810. It would be an honourable thing to commemorate that centenary by a re-issue of his writings, which are small in compass, difficult to obtain, but of great historic interest and value. In 1830 he made a pathetic appeal to the scientific world to furnish him with a hundred and fifty subscribers, as his private income would no longer bear the sacrifice till then entailed by the publication of his researches. He had good reason to be proud of his "discoveries," though he may not have been the first to make them. That is the lot of all discoverers, as Columbus, for example, in finding the New World found it already peopled by men who had known it before he was born. None the less, Vaughan Thompson was a foremost leader in proving that cirripedes (Thyrostraca) are crustaceans and that crustaceans as a rule pass through metamorphic stages. He was also undeniably in the vanguard of those who proved that the term Zoophytes had been used to cover a mixture of animals superficially alike but essentially different in structure.

In regard to this latter part of his investigations, a curious terminological dispute or difference of usage has arisen. While practically all Continental and American writers speak of a class Bryozoa, a very distinguished section of British experts apply the name Polyzoa to a class identically the same. Possibly the arguments in favour of either term may be so evenly balanced that after discussion we shall leave off where we began, each side thinking that it has had the better in the controversy and applying to those of the opposite opinion the French proverb "Chacun à son goût," or, as sometimes amplified, "Chacun à son vilain goût."

On the one hand, then, it may be urged that no confusion can arise from the retention of both the terms. They have become perfectly familiar as equivalents. Some writers even head their treatises "Bryozoa *or* Polyzoa," as though it were a matter of complete indifference, and perhaps wishing to insinuate to the disputants "a plague on both your houses." Further, it is clear that the names of classes and orders have never been subject to so strict a discipline as the names of genera and species, probably because, while the limits of the higher divisions remained essentially unstable, fixity in their designation has been felt to be inconvenient or unreasonable. In fact, as Lord Walsingham has urged in the introduction to his Merton Code, the moral law, the law of giving every man his due, is the strongest foundation on which any precise methods can be based.

Again, it may be argued that any defect in the form of

Thompson's term Polyzoa is venial, considering the date of its publication. Thus in 1814 Leach named an order Podosoma, which in 1816 he silently corrected into a proper plural Podosomata. In 1843 the French author René Primevère Lesson recalls the family Plethosoma which he had established in 1828, in order at the later date to make of it a tribe, with the name unaltered, and including in it a genus also named *Plethosoma*.

It will be no breach of confidence, I think, to quote the unpublished words of a leading authority on this subject, who writes to me as follows: "I base my action on two considerations: (1) That Thompson was the first to recognize the Polyzoa as a distinct type of structure in the Animal Kingdom; and, moreover, introduced a name that can quite fairly be used as that of the Class or Phylum. (2) That a large proportion of the work that has been done on the group has been done by men who have consistently spoken of these animals as the Polyzoa. I need only mention Busk, Allman, Hincks, Norman, and perhaps Hyatt in America."

As a matter of fact, it was apparently Dr. Gray in 1840 who first gave currency to Polyzoa (in the plural) as the name of an extensive animal group, while Busk by his arguments in 1852 and 1859 procured for it vogue among his English followers. It may just possibly be contended that Thompson himself used Polyzoa in the plural number, since on page 92 of his Memoirs he says: "The Polyzoa will probably be found in many dissimilar Genera of the Zoophites, and even mixed up with Hydra in some, as they appear to be in the Sertularia of authors." It should suffice to say that the very paragraph in which this ambiguous "they" occurs ends with the genuine plural Polyzoæ. But yet again on page 96 we read "the Polyzoa however are essentially different." That this is merely a slip of the pen or a printer's error seems absolutely certain, since we have Polyzoæ on page 97 and on page 99, and the Introductory Address, incorporated in Vol. I. of the Researches, promises a future article on "Animals of some Cellariæ, Tubuliporæ and Flustraciæ, proved to be Polyzoæ."

That Thompson's use of the word Polyzoa antedates Ehrenberg's introduction of the name Bryozoa cannot be denied.

Whether these various considerations, or any others which I have failed to discover, justify our eminent English authorities in their usage of the term Polyzoa, is a question now to be presented from an opposite point of view.

Strangely enough the first witness to be called is Busk, the very *fons et origo mali*, as evidence himself against himself. Speaking of Vaughan Thompson, he says, "It is to be remarked that he used the word in the singular number, so that the plural term 'Polyzoa,' as now employed, though etymologically more correct is not in reality synonymous with that of Dr. J. V. Thompson." And he adds that this fact "may fairly enough be used as an argument in their favour by those who are inclined to prefer the

Ehrenbergian term Bryozoa." What amazing candour on the part of an advocate for the use of one term, when he declares that fair argument is in favour of our using the other. Here, too, it should be remembered that Busk's action had to be judged by itself at the time when it was taken. It could not rely on a long list of famous experts in 1852. Allman and Hincks, Norman and Harmer, Herdman and Gardiner, Nicholls and Thornely, Kirkpatrick and Annandale, had not yet either written on the subject or expressed any opinion on its proper title.

Observe, further, that Busk's article in the 'Annals' of 1852 is "On the Priority of the Term 'Polyzoa' for the Ascidian Polypes." As a very imperfectly informed amateur on this branch of zoology, I venture to ask the learned disciples of Busk whether the animals which they call Polyzoa *are* Ascidians. They will in their answer no doubt give away their tutelary genius. But Busk himself would probably have paused in upholding what he supposed to be Thompson's claim, had he been conscious of the fact that, prior to the publication of Thompson's memoir, R. P. Lesson, in the 'Voyage de la Coquille' (vol. ii. p. 437), had already used *Polyzoa* in the singular number for a genus of compound ascidians. He would probably have thought it quite inexpedient to have a word, undistinguishable in sound and spelling from that generic name, as appellation of a much higher group.

Here it is right to confess that Lesson's 'Manuel de l'histoire des Mollusques,' to which I referred in the Linnean circular for 2nd March, 1911, has not proved to be procurable either in France or England. But the same Lesson in his 'Histoire naturelle des Zoophytes,' p. 56, 1843, declares that his contribution to the zoology of 'La Coquille' was "tiré à part et mis en commerce" in 1829. The priority, therefore, of Lesson's Polyzoa over Thompson's can scarcely be disputed. Whether in Zoology it is desirable, allowable, or in accordance with any good precedent, that a name previously adopted for a genus should be independently repeated as the name of a class or phylum, it would be presumptuous in me to decide. Branchiopoda, I admit, has been sometimes retained for an Entomostracan order, very likely from ignorance of its earlier employment as a generic name by Lamarck in 1801.

But surely no rare exception, if any valid one can be found, ought to be followed in the present instance, for why should a claim be asserted for Thompson which he never made for himself? Some stress has been laid on the words which he uses in regard to his Polyzoa (p. 92), that "this discovery must be the cause of extensive alterations and dismemberments in the Class with which they have hitherto been associated." But in the very same paragraph he immediately proceeds, not to establish a new Class, but simply to transfer all such species and genera as contain his "new animal" from the class Zoophytes to the class Mollusca acephala, adding, "I shall merely indicate here in a general way

the whole of the Flustraceæ, in many of which I have clearly ascertained the animals to be Polyzoæ."

Now, in regard to that last remark, without casting the slightest imputation on Thompson's originality, one must again appeal to Busk, who, publishing in 1859, says: "Thirty-one years ago, Dr. Grant, in some 'Observations on the Structure and Nature of Flustræ,' drew, for the first time, a distinction between the animals inhabiting those growths, and the Sertularian, or Hydroid Polypes, with which they had previously been associated." These Observations by Dr. R. S. Grant appear in the Third volume of the Edinburgh New Philosophical Journal (pp. 107, 337), which is dated 1827, so that he has two years precedence of Thompson and three of Ehrenberg. A nice flusteration there will be if we start a new school of writers calling the class Flustræ! And yet in the language of Busk, "It is scarcely likely that British naturalists will refuse the honour justly due to Dr. R. S. Grant, for what can scarcely perhaps be regarded as a sufficient reason."

Seriously speaking, in the face of Busk's admission that it was Grant who, for the first time, drew the distinction, it can scarcely be maintained that Thompson was the first to recognize the Polyzoa as a distinct type of structure in the Animal Kingdom. This is no denial of his statement that "the discovery of Polyzoa was made in the summer of 1820." My own belief is that, had he published in 1820, he would have made a new genus Polyzoa for the *Sertularia imbricata* of Adams. But, as we all know, recognition of our discoveries has to date, not from the time when they were made, but from the time when they were published. For aught we know, Grant also may have carried out his observations ten years before he made them public.

As an observer of nature Thompson was in the highest degree keen and admirable; in nomenclature he was almost equally erratic and unmethodical. Witness his vacillating use of Shizopoda and Shizopodæ for the Schizopoda of Latreille, his unmeaning name *Nocticula* for a luminous shrimp, his unjustified change of that shrimp's specific name from *fulgens* to *banksii*, his adoption of *Cynthia* and *Pedicellaria* for new genera, though he was avowedly aware that each had been previously used in a different sense.

That Polyzoa either in the singular or plural is not a term worth contending for in respect of its appropriateness, should be felt at least by members of that famous University which claims the fine scholarship of Milton and Gray, of Porson and Munro, for the Greek word *πολύζωος* happens to mean long-lived, not many-animaled, and even if it had the latter meaning it would be undistinctive, being equally applicable to many species in quite different groups. But some witchcraft must have put a spell upon Thompson in respect of names. When he has to mention the *Cancer scorpioides* of Montagu, he calls it *scorpionurus*. After his death he leaves behind him a manuscript genus *Scorpionura*, once more a preoccupied name. In place of this Spence Bate founded on the words Vaughan Thompson a new concoction. But the

spell still works. Again there is vacillation. Again there is controversy. To my mind it is clear that in 1858 Bate called his genus Vaun*thomp*sonia, that in 1859 he changed it to Vaun*thom*sonia, and finally in 1860 decided for Vaun*tomp*sonia. But another oracle maintains that the *tomp* was earlier than the *thomp*. We must wait and see.

Now all this slight skirmishing may easily and perhaps justifiably be dismissed with the remark, that the argument against Polyzoa is advanced by one who has little or no intimate acquaintance with the subject matter in which he is interfering. But there is at least one writer, a Fellow of this Society, against whom such a reproach cannot possibly be urged. It may well be that some of us are ill acquainted with the arguments on this topic powerfully stated by the veteran Bryo-zoologist, A. W. Waters, so far back as 1880. But all those in the least interested in the matter are bound to have taken into account his paper of December 16th, 1909, published in our Journal so recently as the 22nd of June, 1910. Nevertheless, to refresh our memories, I shall do myself the pleasure of quoting his two concluding paragraphs. He writes:—"As a young man when I presented papers, those in authority said, you should not use Bryozoa when Busk and others use Polyzoa. I pointed out my reasons and induced them to examine Thompson's paper, and they all, without exception, said they considered I was quite right and that there could not be any question of Thompson using Polyzoa as a class name. Such able literary and scientific critics as Mr. Dallas and Dr. Francis became quite convinced, and Mr. Dallas in a review of Hincks's book put the question more clearly than it has been put by anyone else. A number of members of the staff of the British Museum working upon invertebrates met together to examine Thompson's paper, and unanimously came to the conclusion that Polyzoa was not given as a class designation.

"Bryozoa was for a long time used in England, and then Busk introduced Polyzoa as being Thompson's name. I was not surprised that Busk, Allman, and Hincks, who had worked together, did not change, but I felt confident that the change would soon be made by a younger generation. In this I seem to have been mistaken; and so long as any of our leaders use Polyzoa we must recognise that there are two sides to the question, though I find it very difficult to understand how this can be if we try to divest ourselves of the knowledge gained since Thompson's time and put ourselves in his position." (Journ. Linn. Soc., Zool. vol. xxxi. p. 247.)

You will not fail to notice the modesty of that conclusion. It warns me not to alienate goodwill by being too self-assertive, and to bring my treatment of the matter to an end, before you become too sorry that it ever had a beginning.

On *Vaunthompsonia*, Bate.

For the difficulties which beset our use of this generic name, Vaughan Thompson, in whose honour it was invented, is only indirectly responsible. The genus belongs to the Sympoda, for long but very unsuitably known as Cumacea, in dealing with which among many eminent names there are, I think, pre-eminent, Kröyer in Denmark, Sars in Norway, and our own Dr. Calman in England. Now in this remarkable group Thompson, as already intimated, promised but never gave "Detail of the curious structure of several species of the newly instituted Genus Condylura (Cancer Scorpionurus of Montagu)." No doubt he intended to refer to "*Cancer Scorpioides*" of Montagu, but among his collections there were subsequently found specimens labelled as three species of a new genus *Scorpionura*. Here he had once again the misfortune to choose a name preoccupied before his own use of it was published. Thus it came about that Spence Bate instituted the genus *Vaunthompsonia* for one of Thompson's three species. For the record of this genus we are indebted first of all to Professor Kinahan, through the 'Natural History Review,' vol. v. pp. 202–205, 1858. The professor there says, "I have extracted Mr. Bate's communication and figures *in extenso* from the 'Journal of the Royal Dublin Society,' before whose evening meeting of the 28th May it was read." The definition of *Vaunthompsonia* (Spence Bate) is included in the communication. Next year, in the 'Annals of Natural History,' ser. 3, vol. iii. pp. 273–274, no. 16 for April 1859, Spence Bate speaks of the genus Vaun*thom*sonia, recently described by me in the 'Natural History Review.' Then finally, in the 'Journal of the Royal Dublin Society,' vol. ii. 1858–1859 (Dublin: Hodges, Smith, & Co., 1860), pp. 101–104, he defines Vaun*tomp*sonia, n. g. In 1905, however, Dr. Calman argues that this last form has priority. Of Vaun*thomp*sonia he says that "it is used in Spence Bate's paper in the Nat. Hist. Review, which appears to be a reprint of, and was probably later than, that in the J. Royal Dublin Soc., in which the aspirate is omitted. In any case the omission was clearly intended by the author, who states that in building up the word the Christian name and the surname of Mr. Vaughan Thompson have been "both spelled according to sound." But the 'Natural History Review' of 1858, in which Bate's paper appeared through the intervention of Kinahan, recorded the Proceedings of various Irish Societies, much as 'Nature' and 'The Athenæum' nowadays record the Proceedings of many Societies, as a rule far in advance of the Journals of the Societies themselves. There is no reason for thinking that the 'Journal' of the Royal Dublin Society, published under the date of 1860, was earlier than the 'Natural History Review' of 1858. But there *is* a reason for thinking that it was later, since, as already mentioned, Spence Bate in April 1859 speaks of the genus Vaun*thom*sonia, recently described

by me in the 'Natural History Review.' Why should he refer to that Review, if the genus had been published still earlier in the Royal Dublin Society's Journal, and why should he retain the aspirate, if he had already entertained the happy idea of rejecting it? It is evident that, contrary to modern notions, he thought that he had a right to do what he liked with his own. So he first wrote Vaun*thomp*sonia, as recited by Kinahan in 1858. Then in 1859 he improved this into Vaun*thom*sonia, and finally in 1860 he dropped the aspirate but resumed the *p* in the form Vaun*tomp*sonia. Modern rules require that we should revert to the first published *Vaunthompsonia*.

Against retaining Cumacea, proposed by Kröyer in 1846, I venture to indulge the vanity of quoting from my friends Dr. Norman and Dr. Brady, who in their 'Crustacea of Northumberland and Durham,' p. 25, say, "The name Cuma of Humphreys, 1795, being in use for a genus of Mollusca, the Rev. T. R. R. Stebbing has discarded it among Crustacea, substituting for it *Bodotria* Goodsir, and for the order Cumacea the more appropriate name Sympoda."

Not only was *Cuma*, as used by Milne-Edwards, a preoccupied name, but apparently it had the further disadvantage of embalming an error to which that great naturalist obstinately adhered in regard to the Sympoda. He thought that his specimens were embryonic, and in naming a genus for them he chose a Greek word meaning among other things "an embryo." But, apart from the misfortunes of its origin, this genus had no right of priority in determining the name of the order, since *Diastylis* had been well defined by the American Say ten years earlier. In Sympoda we have a form corresponding with Decapoda, Schizopoda, Stomatopoda, Isopoda, and Amphipoda, all of them important divisions of the Malacostraca.

(*d*)

Mr. S. F. Harmer did not agree with Mr. Stebbing's conclusions. He pointed out that the Laws of Priority which govern generic and specific names do not apply with equal force to group-names. He regarded the criticism that Thompson usually (though not always) employs "Polyzoa" as a singular word as comparatively unimportant when taken in conjunction with the broad conclusion which Thompson saw so clearly, that the observations he had made would "render extensive alterations and dismemberments" in classification necessary. The title of Thompson's memoir shows indeed that "Polyzoa" is not a generic term, but is of higher value: in other words, that it is a group-name. The priority of "Polyzoa" over "Bryozoa" is admitted, and there is evidence that it was used by Thompson even earlier than December, 1830, the date on the wrapper of No. IV. of the 'Zoological Researches,' which consists of "Memoir v, On Polyzoa." The wrapper of No. III., which is headed January,

1830, bears the announcement (dated by Thompson December, 1829) that the Fourth Number will contain "a Memoir on *Polyzoa*, a new animal discovered as an inhabitant of some Zoophites." The speaker considered that Thompson's clear realisation of the effect his discovery must have in altering current views with regard to the classification of Zoophytes constitutes ample justification for preferring "Polyzoa" to "Bryozoa."

(*e*)

Mr. A. W. Waters said that his reasons for using the term Bryozoa were given many years ago, and he had recently restated his firm adherence to the view arrived at. But it will be well to first clear up a mistake which has misled many, for most naturalists have looked to Busk's 'Crag Polyzoa' to see why he changed from Bryozoa to Polyzoa; and speaking of Thompson, Busk writes: "The term he employed was Polyzoa, 'it being applied,' as he says, 'to a distinct class of Polypes hitherto in great measure confounded with the Hydroida'": although this is given as a quotation, in inverted commas, Thompson never said anything of the kind, and a critical examination shows how impossible it would have been for him to have written it.

The speaker said his point had always been that Thompson gave no indication that he was establishing a class. The paper is on "Polyzoa, *a new animal discovered as an inhabitant of some Zoophites*," and then he speaks of the animal as Polyzoa, and this idea of the animal being a Polyzoa, but the animals Polyzoæ, is repeated several times in the paper. Thompson considered that a certain section of the zoophytes must ultimately be separated, as the polypides were not hydra, and we must remember that at that time the polypes of Hydrozoa were still spoken of as flores, and there were perhaps naturalists still living who had believed that the polypides of *Flustra* could leave the zoœcium whenever they wished, just as a bee can leave its cell.

A year before Thompson's paper, Cuvier had separated the Bryozoa as "Polypes à cellules" as a distinct family from "Polypes vaginiformes," namely the Hydrozoa, but said the animals in both cases resemble Hydræ.

It has been urged that Thompson having seen the great difference between the Bryozoa and other zoophytes, we ought to honour him by retaining the name Polyzoa. However, if he did not create the class we must remember that he was not the first to publish the difference, for Dr. Grant (1827) had seen that a separation must be made, and he based it upon the Bryozoa having no common cœnosarc, but, though he described the polypide correctly, he did not recognise that the digestive tract had two openings. Then Audouin and Milne-Edwards (1828), studying the marine invertebrates of Chausey, divided the Polypes, or Zoophytes, into four families, and these were, as we should say,

approximately (1) Sponges, (2) Hydrozoa, (3) Anthozoa, and (4) Bryozoa; and of this last they said, *our fourth family contains Flustra and the other Polypes of which the digestive canal communicates with the exterior by two distinct openings, and of which the organisation approaches that of the compound Ascidians.* At the meeting of the French Academy, when the paper was read, Blainville stated that he was aware of this structure, and that it had been also pointed out to him some years ago by Lesueur and Desmarest; so that several observers had independently come to the same conclusions, within a few years of one another.

It is strange to find these divisions called families, where we should say orders and classes, but nothing could be clearer than that Audouin and Milne-Edwards forestalled Thompson and distinctly indicated a division, for we must not forget that *Flustra* then always included *Membranipora* and was sometimes used where we should say Cheilostomata. It is surprising how seldom zoologists of that period, working on the zoophytes, ever refer to Classes or Orders, and often use class as a general term instead of group. Lamarck, in 'Hist. Nat. des Animaux sans Vertèbres,' instead of classes and orders, says divisions and sections.

In conclusion, if Thompson meant to establish a class division, then his paper is an extraordinary muddle of a communication; whereas, if he wished to indicate the nature of the polypide, it is consistent from beginning to end, and though forestalled in his main points we must respect him for it.

ADDITIONS AND DONATIONS

TO THE

LIBRARY.

1910–1911.

Adamović (Lujo). Die Vegetationsverhältnisse der Balkanländer (Mösische Länder) umfassend Serbien, Altserbien, Bulgarien, Ostrumelien, Nordthrakien und Nordmazedonien. Pp. xvi, 567; mit 49 Vollbildern, 11 Textfiguren und 6 Karten. (Engler-Drude, Vegetation der Erde, xi.) 8vo. *Leipzig*, 1909.

Ameghino (Florentino). Sur l'orientation de la Calotte du Diprothomo. Pp. 11. (An. Mus. Nac. Buenos Aires, xx.) 4to. *Buenos Aires*, 1910.

—— Montaneia Anthropomorpha un género de Monos hoy extinguido de la Isla de Cuba. Nota Preliminar. Pp. 2. (An. Mus. Nac. Buenos Aires, xx.) 4to. *Buenos Aires*, 1910.

—— L'Âge des formations sédimentaires tertiaires de l'Argentine en relation avec l'Antiquité de l'Homme. Note Supplémentaire. Pp. 11. (An. Mus. Nac. Buenos Aires, xxii. pp. 169–179.) 4to. *Buenos Aires*, 1911.

—— Observations au sujet des Notes du Dr. Mochi sur la Paléoanthropologie Argentine. Pp. 50, with 16 illustrations. (An. Mus. Nac. Buenos Aires, xxii. pp. 181–200.) 4to. *Buenos Aires*, 1911.

—— La Calotte du Diprothomo d'après l'orientation fronto-glabellaire. Pp. 9; plates 4. (An. Mus. Nac. Buenos Aires, xxii.) 4to. *Buenos Aires*, 1911.

—— Las escorias y tierras cocidas de las formaciones sedimentarias neogenas. Pp. 36; plates 6. (An. Mus. Nac. Buenos Aires, xxii.) 4to. *Buenos Aires*, 1911.

—— L'Âge des formations sédimentaires tertiaires de l'Argentine en relation avec l'Antiquité de l'Homme. Pp. 31. (An. Mus. Nac. Buenos Aires, xxii.) 4to. *Buenos Aires*, 1911. **Author.**

Andrews (Charles William). A Descriptive Catalogue of the Marine Reptiles of the Oxford Clay. Part. I. *See* **British Museum (Natural History)**—Fossils. 4to. 1910.

Annandale (Nelson). *See* **Blanford (W. T.).** The Fauna of British India, including Ceylon and Burma. Freshwater Sponges, Hydroids, and Polyzoa. 8vo. 1911.

Appel (Louise C.). *See* **Kleinschrod (Franz).** The Inherent Law of Life. 8vo. *London*, 1910.

Arber (Edward Alexander Newell). Plant Life in Alpine Switzerland. Pp. xxiv, 355; with 48 plates and 80 figs. in the text. 8vo. *London*, 1910. **Author.**

Bailey (Charles). A third List of the Adventitious Vegetation of the Sandhills of St. Anne's-on-the-Sea, North Lancashire (vice-county 60). Pp. 11. (Mem. & Proc. Manch. Lit. Phil. Soc. vol. 54, part 3.) 8vo. *Manchester*, 1910. **Author.**

Baker (Richard Thomas) and Smith (Henry G.). A Research on the Pines of Australia. (Technol. Mus. N. S. Wales, Educ. Ser. n. 16.) Pp. xiv, 458; with 73 plates, 3 charts, & 298 illustrations in the text. 4to. *Sydney*, 1910. **Authors.**

Balfour (Henry). *See* **Tongue (Miss Helen).** Bushman Paintings. 4to. *Oxford*, 1909.

Barrett-Hamilton (Gerald E. H.). A History of British Mammals. Parts 1–8. 8vo. *London*, 1910–1911.

Beiträge zur Kryptogamenflora der Schweiz. Auf Initiative der Schweiz. Botanischen Gesellschaft und auf Kosten der Eidgenossenschaft. Herausgegeben von einer Kommission der Schweiz. Naturforschenden Gesellschaft. Bände I–III. 8vo. *Bern*, 1898–1911.

Band II. Heft 2. Fischer (Eduard). Die Uredineen der Schweiz. Pp. xciv, 590; mit 342 Figuren im Text 1904.
„ III. Heft 1. Lendner (Alfred). Les Mucorinées de la Suisse. Pp. 180; avec 59 figures et 3 planches. 1908.
„ „ Heft 2. Schellenberg (Hans Conrad). Die Brandpilze der Schweiz. Pp. xlv, 180; mit 79 Textfiguren. 1911.

Berlin.

Das Tierreich. Herausgegeben von der Deutschen Zoologischen Gesellschaft. Generalredakteur: Franz Eilhard Schulze. Liefg. 26, 27, 29. 8vo. *Berlin*, 1911.

Liefg. 26. Ixodidæ. Von L. G. Neumann. Pp. vi, 169; mit 76 Abbildungen. 1911.
„ 27. Reptilia.—Chamæleontidæ. Von Prof. Dr. Franz Werner. Pp. xi, 52; mit 20 Abbildungen. 1911.
„ 29. Vermes.—Chætognathi. Von Rudolf von Ritter-Záhony. Pp. viii, 35; mit 16 Abbildungen. 1911.

Bezzi (Mario). Diptères (Première Série) suivi d'un Appendice sur les Diptères cavernicoles recueillis par le Dr. Absolon dans les Balcans. Pp. 88; figs. 22. (Arch. Zool. Expér. Génér. vol. 48, n. 1.) 8vo. *Paris*, 1911.

Bibliotheca Botanica (*continued*).

Heft 73. Geheeb (Adalbert). Bryologia atlantica.—Die Laubmoose der atlantischen Inseln (unter Ausschluss der europäischen und arktischen Gebiete). Ergänzt und bearbeitet von Theodor Herzog. Pp. 32; Taf. 10. 1910.

Bibliotheca Zoologica (*continued*).

Band XXIII. Heft 59. Daday (Eugen von). Untersuchungen über die Süsswasser-Mikrofauna Deutsch-Ostafrikas. Pp. 314; mit 18 Tafeln und 19 Textfiguren. 1910.
„ Heft 60. Krauss (Hermann August) (Tübingen). Monographie der Embien. Pp. 78; mit 5 Tafeln und 7 Textfiguren. 1911.

Bibliotheca Zoologica (*continued*).

Band XXIV. Heft 61. Rübsaamen (Ewald H.). Die Zoocecidien, durch Tiere erzeugte Pflanzengallen Deutschlands und ihre Bewohner. Pp. 293; 6 Tafeln und 3 Textfiguren.

Thomas (Friedrich August Wilhelm). Verzeichnis der Schriften über deutsche Zoocecidien und Cecidozoen bis einschliesslich 1906. Pp. 1–105.

Küster (E.). Allgemeiner Teil. Pp. 105–165.

Nalepa (Alfred). Eriophyiden (Gallenmilben). Pp. 166–293. 1911.

Band XXV. Heft 62. Hempelmann (Friedrich). Zur Naturgeschichte von *Nereis dumerilii*, Aud. et Edw. Pp. 135; mit 4 Tafeln und 14 Textfiguren. 1911.

Blanford (William Thomas). The Fauna of British India, including Ceylon and Burma .... Edited by W. T. Blanford (and Lieut.-Col. C. T. Bingham and Arthur E. Shipley). 8vo. *London, &c.*, 1888–1911.

Rhynchota.—Vol. V. Heteroptera: Appendix. By W. L. Distant. Pp. xii, 362; with 214 illustrations. 1910.

Freshwater Sponges, Hydroids, and Polyzoa. By N. Annandale. Pp. viii, 251; plates 5, figs. 49. 1911.

Bloomer (Harry Howard). Anatomy of British Species of *Psammobia*. Pp. 9; 2 plates. (Proc. Malacol. Soc. ix. part 4.) 8vo. *London*, 1911. **Author.**

Bolton (James). *See* **Crossland (Charles).** An Eighteenth Century Naturalist: Jas. Bolton, Halifax. Pp. 32. 8vo. 1910.

Borgert (A.). *See* **Plankton-Expedition der Humboldt-Stiftung.** Die Tripyleen Radiolarien der Plankton-Expedition. Challeneridæ. 4to. 1911.

Boulenger (George Albert). Catalogue of the Fresh-Water Fishes of Africa in the British Museum (Natural History). Vol. II. Pp. xii, 529; with 382 illustrations in the text. 4to. *London*, 1911.

Bournemouth.

Bournemouth Natural Science Society. Vol. II. 8vo. *Bournemouth*, 1911. **R. V. Sherring.**

Bower (Frederick Orpen). The Origin of a Land Flora: a Theory based upon the Facts of Alternation. Pp. xi, 727; with 361 illustrations. 8vo. *London*, 1908. **Author.**

Brehm (Vincenz). Die Entomostraken der Danmark-Expedition. Pp. 15; mit 2 Tafeln. (Danmark-Exped. Grønlands Nordostkyst, Bind v. n. 5, Meddel. om Grønland, xlv.) 8vo. *Copenhagen*, 1911. **Author.**

Brenchley (Winifred Elsie). The Weeds of Arable Land in relation to the Soils on which they grow. Pp. 11. (Ann. Bot. xxv.) 8vo. *Oxford*, 1911. **Author.**

Briquet (John). Prodrome de la Flore Corse, comprenant les résultats botaniques des six voyages exécutés en Corse sous les auspices de Émile Burnat. Vol. I.→ 8vo. *Genève, Bâle, Lyon*, 1910→

British Association for the Advancement of Science. Report (Sheffield) 1910. 8vo. *London*, 1911. **Council Brit. Assoc.**

—— Handbooks:—Handbook and Guide to Sheffield. Prepared under the Direction of the Local Publications Sub-Committee. Editor, WILLIAM S. PORTER; Hon. Secretary, ARNOLD T. WATSON. Pp. iv, 502; illustrated. 8vo. *Sheffield*, 1910. **Town Clerk, Sheffield.**

British Museum (*continued*).

Catalogue of the Books, Manuscripts, Maps, and Drawings in the British Museum (Natural History). Vols. I.–III. 4to. *London*, 1903–10.

MAMMALS.

Monograph of the Okapi. By Sir E. RAY LANKESTER. Compiled with the Assistance of W. G. RIDEWOOD. Atlas (of 48 plates). 4to. *London*, 1910.

FISHES.

Catalogue of the Fresh-Water Fishes of Africa in the British Museum (Natural History). By G. A. BOULENGER. Vol. II. Pp. xii, 529; with 382 figs. 4to. *London*, 1911.

INSECTS.

Dipterous Insects.

A Monograph of the Culicidæ or Mosquitoes. Mainly compiled from Collections received at the British Museum. By FRED. V. THEOBALD. Vol. V. Pp. xiv, 646; plates 6, with 261 illustrations in the text. 8vo. *London*, 1911.

A Handbook of the Tsetse-Flies [Genus *Glossina*]. By ERNEST E. AUSTEN. Pp. x, 110; with 10 col. plates and 24 figs. in the text. 8vo. *London*, 1911.

Lepidopterous Insects.

Catalogue of the Lepidoptera Phalænæ. Vol. X. Catalogue of the Noctuidæ in the Collection of the British Museum. By Sir GEORGE F. HAMPSON, Bart. Pp. xix, 829; figs. 214, plates 148–173. 8vo. *London*, 1911.

PLANTS.

Flora of Jamaica, containing descriptions of the Flowering Plants known from the Island. By WILLIAM FAWCETT and ALFRED BARTON RENDLE. Vol. I. Orchidaceæ. Pp. xviii, 150; plates 32. 8vo. *London*, 1910.

A Monograph of the British Lichens: a Descriptive Catalogue of the Species in the Department of Botany, British Museum. By ANNIE LORRAIN SMITH. Part II. Pp. v, 409; with 59 plates. 8vo. *London*, 1911.

British Museum (*con.*).

FOSSILS.

A Descriptive Catalogue of the Marine Reptiles of the Oxford Clay. By CHARLES WILLIAM ANDREWS. Part I. Pp. xxiii, 205; with 10 plates and 94 figs. in the text.
4to. *London*, 1910.

Cambridge County Geographies. General Editor: F. H. H. GUILLEMARD. 8vo. *Cambridge*, 1911.

Berkshire. By H. W. MONCKTON. Pp. x, 166; with maps, diagrams, and illustrations. 1911. **H. W. Monckton.**

Cambridge (The) Manuals of Science and Literature. Editors: P. GILES and A. C. SEWARD. 8vo. *Cambridge*, 1910.

JUDD (JOHN WESLEY). The Coming of Evolution. Pp. 171, with 4 portraits. 1910.

Cambridge Natural Science Manuals. Biological Series. General Editor: ARTHUR E. SHIPLEY. 8vo. *Cambridge*, 1898–1910.

WARD (H. MARSHALL). Trees. 5 vols. 1904–1910.
I. Buds and Twigs. Pp. xiv, 271; figs. 136. 1904.
II. Leaves. Pp. x, 348; figs. 124. 1908.
III. Flowers. Pp. xii, 402; figs. 142. 1905.
IV. Fruits. Pp. 161; figs. 147. 1908.
V. Form and Habit, with an Appendix on Seedlings. Pp. x, 308; figs. 209. 1910.

Cameron (John). Firminger's Manual of Gardening for India. Fifth Edition. Pp. xix, 710; with 2 plates and 28 figs.
8vo. *Calcutta*, 1904. **J. Cameron.**

Candolle (Anne Casimir Pyramus de). Sur des fleurs anormales du *Leontopodium alpinum β. nivale* (Ten.), DC. Pp. 3; fig. 1. (Bull. Soc. Bot. Genève, 2 sér. ii. n. 9.) 8vo. *Genève*, 1910.

—— Sur les feuilles anormales du *Strelitzia reginæ*, Ait. Pp. 3; illustr. 1. (Bull. Soc. Bot. Genève, 2 sér. ii. n. 9.)
8vo. *Genève*, 1910.

—— Philippine Piperaceæ. Pp. 32. (Leaflets of Philippine Bot. iii. Art. 44.) 8vo. *Manila*, 1910.

—— A Revision of Philippine Piperaceæ. Pp. 60. (Philippine Journ. Sci. vol. v. C. Bot.) 4to. *Manila*, 1910.

—— Piperaceæ and Meliaceæ of New Guinea. Pp. 12. (Rés. Expéd. Sci. Néerl. Nouvelle Guinée, viii. Bot., livr. 2.)
4to. *Leide* [1910].

—— Note sur la distribution géographique des espèces du genre *Peperomia*, R. et Pav. Pp. 4. (Bull. Géogr. Bot. organe Acad. intern. Bot. 4 sér. xx. n. 255.) 8vo. *Genève*, 1911. **Author.**

Candolle (Augustin de). Biologie des Capsules Monospermes. Pp. 21. (Arch. Sci. Phys. et Nat. 4 sér. xxv.)
8vo. *Genève*, 1908.

—— À propos du mémoire de A. Woeikof sur l'extension du hêtre fonction du Climat. Pp. 3. (Arch. Sci. Phys. et Nat. 4 sér. xxx.) 8vo. *Genève*, 1910. **Author.**

Cape of Good Hope.
Department of Agriculture.
Marine Investigations in South Africa. Vol. V.
8vo. *Cape Town*, 1908. **J. D. F. Gilchrist.**

Chapman (Frederick). A Synopsis of the Silurian Fossils of South Yarra and the Yarra Improvement Works. Pp. 8. (Victorian Nat. xxvii. no. 4.) 8vo. *Melbourne*, 1910.

—— New or Little-known Victorian Fossils in the National Museum.—Part. XI. On an Impression of a Bird's Feather in the Tertiary Ironstone of Redruth, Victoria. Pp. 6, with 2 plates. (Proc. Roy. Soc. Victoria, xxiii. part 1.)
8vo. *Melbourne*, 1910.

—— —— Part XII. On a Trilobite Fauna of Upper Cambrian Age (*Olenus* Series) in N.E. Gippsland, Victoria. Pp. 20, with 4 plates. (Proc. Roy. Soc. Victoria, N. S. xxiv. pt. 2.) 8vo. *Melbourne*, 1911.

—— A Revision of the Species of *Limopsis* in the Tertiary Beds of Southern Australia. Pp. 14, with 3 plates. (Proc. Roy. Soc. Victoria, N. S. xxiii. pt. 2.) 8vo. *Melbourne*, 1911.

—— On some supposed Pyritized Sponges from Queensland. Pp. 4, with 1 plate. (Proc. Roy. Soc. Victoria, N. S. xxiii. pt. 2.) 8vo. *Melbourne*, 1911. **Author.**

Church (Arthur Harry). Types of Floral Mechanism, a selection of Diagrams and Descriptions of Common Flowers, arranged as an Introduction to the Systematic Study of Angiospermes. Part I. Pp. vii, 211. Types I.–XII. 4to. *Oxford*, 1908.
Prof. **Sydney H. Vines.**

Cockayne (Leonard). New Zealand Plants and their Story. Pp. vii, 190; with 71 illustrations. 8vo. *Wellington*, 1910.
Author.

Cole (Abdiah). *See* **Riverius (Lazarus).** The Practice of Physick, &c. fol. *London*, 1661.

Collinder (Erik). Medelpads Flora, växtgeografisk öfversikt och systematisk förteckningöfver kärlväxterna. Pp. viii, 190; with map. 4to. *Uppsala & Stockholm*, 1909. **Author**

Connold (Edward Thomas). Plant Galls of Great Britain, a Nature Study Handbook. Pp. xii, 292; with 354 illustrations. 8vo. *London*, 1909. **Dr. B. Daydon Jackson.**

Crossland (Charles). An Eighteenth Century Naturalist: James Bolton, Halifax. Pp. 32. (This paper appeared in the 'Halifax Guardian,' and is reprinted with slight alterations.) 8vo. *Halifax*, 1910. **Author.**

Culpeper (Nicholas). *See* **Riverius (Lazarus).** The Practice of Physick, &c. fol. *London*, 1661.

Daday (Eugen von). Untersuchungen über die Süsswasser-Mikrofauna Deutsch-Ostfrikas. Pp. 314; mit 18 Tafeln und 19 Textfiguren. (Bibl. Zool. xxiii. Heft 59.)
4to. *Stuttgart*, 1910.

Deubel (Friedrich). *See* **Holdhaus (Karl).** Untersuchungen über die Zoogeographie der Karpathen. (Abh. k.-k. zool.-bot. Ges. Wien, vi. Heft 1.) 4to. 1910.

Diels (Ludwig). *See* **Engler (H. G. A.).** Das Pflanzenreich. Heft 46. Menispermaceæ. 1910.

Distant (William Lucas). *See* **Blanford (W. T.).** The Fauna of British India, including Ceylon and Burma. Rhynchota. Vol. V. Heteroptera: Appendix. Pp. xii, 362; with 214 illustrations. 8vo. 1910.

Druce (George Claridge). Botanologia of Northamptonshire (Morton). Pp. 46, with 1 plate. (Journ. Northampt. Nat. Hist. Soc. xiv.) 8vo. *Northampton*, 1908.

—— Address on the Unveiling of the Monument to George Don at Forfar, September 8, 1910. Pp. 8. 8vo. *Oxford*, 1910. **Author.**

Dublin.
Zoological Society of Ireland.
Annual Report 79. 8vo. *London*, 1910.
Dr. R. F. Scharff.

Duggar (Benjamin Minge). Fungous Diseases of Plants. Pp. xii, 508; with 240 illustrations. 8vo. *Boston & London*, 1910

Dyer (Bernard) and Shrivell (Frederick W. E.). The Manuring of Market Garden Crops. New Edition. Pp. 144; illustrated. 8vo. *London*, 1910. **Authors.**

Elliot (George Francis Scott). Botany of To-Day. A popular Account of recent notable Discoveries. Second Edition. Pp. xv, 17–352; with 27 illustrations. 8vo. *London*, 1911. **Author.**

Engler (Heinrich Gustav Adolf). Das Pflanzenreich. Regni Vegetabilis conspectus . . . . Herausgegeben von A. Engler. Hefte 40–47. 8vo. *Leipzig*, 1909–1911.

Heft 40. Fedde (Friedrich). Papaveraceæ-Hypecoideæ et Papaveraceæ-Papaveroideæ. Pp. 430; mit 532 Einzelnbildern in 43 Figuren. 1909.

„ 41. Wangerin (Walther). Garryaceæ. Pp. 17; mit 26 Einzelbildern in 5 Figuren. 1910.
Nyssaceæ. Pp. 19; mit 38 Einzelbildern in 4 Figuren. 1910.
Alangiaceæ. Pp. 24; mit 47 Einzelbildern in 6 Figuren. 1910.
Cornaceæ. Pp. 110; mit 193 Einzelbildern in 24 Figuren. 1910.

„ 42. Pax (F.). Euphorbiaceæ—Jatropheæ. Pp. 148; mit 155 Einzelbildern in 45 Figuren. 1910.

„ 43. Wolff (Hermann). Umbelliferæ—Apioideæ—*Bupleurum*, *Trinia* et reliquæ Ammineæ heteroclitæ. Pp. 214; mit 155 Einzelbildern in 24 Figuren. 1910.

„ 44. Pax (F.). Euphorbiaceæ—Adrianeæ. Pp. 111; mit 151 Einzelbildern in 35 Figuren. 1910.

„ 45. Kränzlin (Fritz). Orchidaceæ—Monandræ—Dendrobiinæ. Pars I. Genera n. 275–277. Pp. 382; mit 327 Einzelbildern in 35 Figuren. 1910.

Engler (Heinrich Gustav Adolf). Das Pflanzenreich (*con.*).

Heft 46. Diels (L.). Menispermaceæ. Pp. 345; mit 917 Einzelbildern in 93 Figuren. 1910.

„ 47. Pax (F.). Euphorbiaceæ—Cluytieæ. Pp. 124; mit 144 Einzelbildern in 35 Figuren unter Mitwirkung von Käthe Hoffmann. 1910.

Macfarlane (J. M.). Cephalotaceæ. Pp. 15; mit 24 Einzelbildern in 4 Figuren. 1911.

—— and **Drude (Oscar).** Die Vegetation der Erde. IX, XI, XII, XIII. 8vo. *Leipzig*, 1908–1911.

IX. Die Pflanzenwelt Afrikas insbesondere seiner tropischen Gebiete; Grundzüge der Pflanzenverbreitung in Afrika und die Charakterpflanzen Afrikas. Von A. Engler. Bände I, II. 1908–1910.

Band I. 1 Hälfte. Allgemeiner Ueberblick über die Pflanzenwelt Afrikas und ihre Existenzbedingungen. Pp. xxviii, 1–478; mit 5 Karten, 20 Vollbildern und 404 Textfiguren. 1910.

„ I. 2te Hälfte. Allgemeiner Ueberblick über die Pflanzenwelt Afrikas und ihre Existenzbedingungen. Pp. xi, 479–1029; mit 1 Karte, 27 Vollbildern und 305 Textfiguren. 1910.

„ II. Charakterpflanzen Afrikas (insbesondere des tropischen). Von A. Engler. Pp. xi, 460; mit 16 Vollbildern und 316 Textfiguren. 1908.

XI. Die Vegetationsverhältnisse der Balkanländer (Mösische Länder). Von Dr. Lujo Adamović. Pp. xvi, 567; mit 49 Vollbildern, 11 Textfiguren und 6 Karten. 1909.

XII. Die Pflanzenwelt der peruanischen Anden. Von A. Weberbauer. Pp. xii, 355; mit 40 Vollbildern, 63 Textfiguren und 2 Karten. 1911.

XIII. Phytogeographic Survey of North America by John W. Harshberger. Pp. lxiii, 790; with 1 map, 18 plates, and 32 figures in the text. 1911.

Errera (Léo). Recueil d'Œuvres de Léo Errera. Botanique générale. I, II. 8vo. *Bruxelles*, 1908–1909.

I. pp. iv, 318; planche 1 et portrait.
II. pp. 341, avec 74 figures dans le texte.

—— —— Mélanges: Vers et Prose. Pp. xiv, 222; portrait. 8vo. *Bruxelles*, 1908.

—— —— Physiologie générale. Philosophie. Pp. xiii, 400; avec 41 figures dans le texte et portrait. 8vo. *Bruxelles*, 1910.

—— Sur l'efficacité des Moyens de Dissémination. Pp. 13, avec 2 planches. (Rec. Inst. bot. L. Errera, viii.). Roy. 8vo. *Bruxelles*, 1910. *Rev.* **G. Henslow.**

Ewart (Alfred James). Plants indigenous to Victoria. Vol. II. 4to. *Melbourne*, 1910. **Author.**

—— The Flora of the Victorian Alps. With a Botanical Report by J. W. Audas. Pp. 17, with 1 plate. (Victorian Nat. xxvii.) 8vo. *Melbourne*, 1910. **Author.**

Ewart (Alfred James), Rees (Bertha), and Wood (Bertha). Contributions to the Flora of Australia. Nos. 14, 15. (Proc. Roy. Soc. Victoria, N. S. xxiii.) 8vo. *Melbourne*, 1910. **Authors.**

Fawcett (William). Flora of Jamaica. *See* **British Museum (Natural History)**—Plants. 8vo. 1910.

Fedde (Friedrich). *See* **Engler (H. G. A.).** Das Pflanzenreich. Heft 40. Papaveraceæ-Hypecoideæ et Papaveraceæ-Papaveroideæ. 1909.

Filarszky (Ferdinand). Botanische Ergebnisse der Forschungsreisen von M. v. Déchy im Kaukasus. Pp. 126; Taf. 25. (von Déchy, Kaukasus, iii.) 4to. *Berlin*, 1910. *Dr.* **B. Daydon Jackson.**

Firminger's Manual of Gardening for India. Fifth Edition. *See* **Cameron (John).** 8vo. 1904.

Fischer (C. E. C.). *See* **Jacquot (A.).** Incendies en Forêt. (Forest Fires.) 8vo. 1910.

Fischer (Eduard). Die Uredinen der Schweiz. Pp. xciv, 590; mit 342 Textfiguren. (Beitr. z. Kryptogamenflora d. Schweiz. Bd. ii. Heft 2.) 8vo. *Bern*, 1904.

Fisher (Herbert). *See* **Home University Library of Modern Knowledge.** 8vo.

Flower (Stanley Smyth). List of Animals in the Zoological Gardens, Giza, near Cairo. Second Edition. Pp. 372; plates 20. 8vo. *Cairo*, 1910. **Author.**

Frédéricq (Léon) et Massart (Jean). Notice sur Léo Errera. Pp. 153 et portrait. 8vo. *Bruxelles*, 1908. *Rev.* **Geo. Henslow.**

Fries (Theodor Magnus). Bref och skrifvelser af och till Carl von Linné, med understöd af Svenska Staten utgifna af Upsala Universitet. Första Afdelningen. Deel iv., v. 8vo. *Stockholm*, 1910–1911. **Univ. of Uppsala.**

Fry (Agnes). *See* **Fry (*Sir* Edward).** The Liverworts British and Foreign. 8vo. 1911.

Fry (*Sir* Edward) and Fry (Agnes). The Liverworts British and Foreign. Pp. viii, 74; with 49 illustrations. 8vo. *London*, 1911. **Authors.**

Fujii (Kenjiro). Some Remarks on the Cretaceous Fossil Flora and the Causes of Extinction. Pp. 25. (Bot. Mag. Tokyo, xxiv. n. 284.) 8vo. *Tokyo*, 1910. **Author.**

—— and **Stopes (Marie Charlotte Carmichael).** Studies on the Structure and Affinities of Cretaceous Plants. Pp. 90; 9 plates. 4to. 1910.

Gamble (James Sykes). The Bamboos of the Philippine Islands. Pp. 15. (Philippine Journ. Sci. v. C. Bot.) 4to. *Manila*, 1910. **Author.**

Garden (The). Vol. 74. 4to. *London*, 1910. **Editor.**

Gardeners' Chronicle. 3 ser. Vols. 47, 48. fol. *London*, 1910. **Editor.**

Geheeb (Adalbert). Bryologia atlantica. Die Laubmoose der atlantischen Inseln (unter Ausschluss der europäischen und arktischen Gebiete). Ergänzt und bearbeitet von Theodor Herzog. Pp. 32; mit 10 col. Tafeln. (Bibl. Bot. Heft 73.) 4to. *Stuttgart*, 1910.

Gerth van Wijk (H. L.). A Dictionary of Plant-names. Parts I., II. 4to. *Haarlem*, 1909–1910.

I. pp. xxiv, 1–710. II. pp. v, 711–1444.

Author.

Giles (P.). *See* **Cambridge Manuals of Science and Literature.** 8vo.

Glück (Hugo). Biologische und morphologische Untersuchungen über Wasser- und Sumpfgewächse. Theile I., II. 8vo. *Jena*, 1905, 1906.

I. pp. xxiv, 312; mit 25 Textfig. und 7 lithogr. Doppeltafeln.
II. pp. xvii, 256; mit 28 Textfig. und 6 lithogr. Doppeltafeln.

Lord Avebury.

Griffiths (B. M.). *See* **West (George Stephen).** *Hillhousia mirabilis*, a Giant Sulphur Bacterium. 8vo. 1909.

Groom (Percy) *See* **Ward (H. Marshall).** Trees. Vol. V. 1909.

Guillemard (F. H. H.). *See* **Cambridge County Geographies.**

Gulia (Giovanni). Intorno ad un nuovo habitat della *Melitella pusilla*, Somm. Pp. 2. (Bull. Soc. bot. Ital. 13 Marzo, 1909.) 8vo. *Firenze*, 1909.

—— Elenco delle Pteridofite Maltesi. Pp. 2. (Bull. Soc. bot. Ital. 11 Dicembre, 1909.) 8vo. *Firenze*, 1909.

—— Addition à la Faune Ichthyologique Maltaise. Pp. 2. (Bull. Soc. Zool. Fr. xxxiv.) 8vo. *Paris*, 1909.

—— Cenni Bibliografici sulla Fauna Vertebrata Maltese. Pp. 21. (Bull. Soc. Zool. Ital. xviii.). 8vo. *Roma*, 1909. **Author.**

Haines (Henry Haselfoot). A Forest Flora of Chota Nagpur, including Gangpur and the Santal-Parganahs, &c. Pp. vii, 634. Index xxxvii. 8vo. *Calcutta*, 1910. **Author.**

Hall (Alfred Daniel). Annual Report for 1910, with the Supplement to the "Guide to the Experimental Plots," containing the Yields per Acre, &c. Rothampsted Experimental Station. Pp. 16. 8vo. *Harpenden*, 1911. **Author.**

Hall (John G.). *See* **Stevens (Frank Lincoln).** Diseases of Economic Plants. 8vo. 1910.

Hamilton. *See* **Barret-Hamilton (Gerald E. H.).** A History of British Mammals.

Hampstead.
Hampstead Scientific Society.
Report for 1909, 1910. 8vo. *Hampstead*, 1910–1911.

Hugh Findon.

Harshberger (John William). Phytogeographic Survey of North America. Pp. lxiii, 790; 1 map, 18 plates, and 32 figures in the text. (Engler-Drude, Vegetation der Erde, xiii.) 8vo. *Leipzig*, 1911.

Hart (John Hinchley). Cacao, a Manual on the Cultivation and Curing of Cacao. Pp. x, 307; with 64 illustrations. 8vo. *London*, 1911. **Author.**

Hatcher (John B.). The Ceratopsia, based on preliminary Studies by Othniel C. Marsh. Edited and completed by Richard S. Lull. Pp. xxx, 300; with 51 plates and 125 illustr. in the text. (U.S. Geol. Surv. Monogr. 49.) 4to. *Washington*, 1907.

Heinricher (Emil). Die Aufzucht und Kultur der parasitischen Samenpflanzen. Pp. iv, 53; mit 8 Abbildungen im Text. 8vo. *Jena*, 1910.

Hempelmann (Friedrich). Zur Naturgeschichte von *Nereis dumerilii*, Aud. et Edw. Pp. 135; mit 4 Tafeln und 14 Textfiguren. (Bibl. Zoologica, xxv. Heft 62.) 4to. *Stuttgart*, 1911.

Hensen (V.). *See* **Plankton-Expedition der Humboldt-Stiftung.**

Das Leben im Ozean nach Zählungen seiner Bewohner, Bd. v. 1911.

Henslow (George). The Frost Reports on the Effects of the severe Frosts on Vegetation during the Winters 1879–80 and 1880–81. Pp. lxv, 338. (Journ. Roy. Hortic. Soc. viii.) 8vo. *London*, 1887. **Author.**

Hereford. Woolhope Naturalists' Field Club for 1905, 1906, 1907. 8vo. *Hereford*, 1911.

Herzog (Theodor). *See* **Geheeb (Adalbert).** Bryologia atlantica. (Bibl. Bot. Heft 73.) 4to. 1910.

Hoffmann (Käthe). *See* **Engler (H. G. A.).** Das Pflanzenreich. Heft 47. Euphorbiaceæ—Cluytieæ. 1911.

Holdhaus (Karl) and Deubel (Friedrich). Untersuchungen über die Zoogeographie der Karpathen (unter besonderer Berücksichtigung der Coleopteren). Pp. vi, 202; mit einer Karte. (Abh. k.-k. zool.-bot. Ges. Wien, vi. Heft 1.) 4to. *Jena*, 1910.

Hollick (Arthur). The Cretaceous Flora of Southern New York and New England. Pp. 219, with 40 plates. (U.S. Geol. Surv. Monogr. 50.) 4to. *Washington*, 1906.

Home University Library of Modern Knowledge. Editors: Herbert Fisher, Gilbert Murray, John Arthur Thomson. 8vo. *London*, [1911].

Scott (Dukinfield Henry). The Evolution of Plants. Pp. 256, with 25 illustrations. 8vo. *London*, [1911].

Hornell (James). The present Depletion of the Oyster-Bed of Sind; its Causes and the Remedies. Pp. 32; with 1 plate and 7 figs. in the text. fol. *Bombay*, 1910. **R. B. Vakil.**

Horwood (Arthur Reginald). Coalmining and Fossil Plants. ('Colliery Guardian,' April 14, 1905.) P. 1. 4to. *London*, 1905.

—— A Contribution to the Palæontology of the North Derbyshire and Notts Coalfield, or the Southern Portion of the North Midland Coalfield. Pp. 21, with 2 plates. (55th Rep. Trans. Nottingh. Nat. Soc. 1906–1907.) 8vo. *Nottingham*, 1907.

Horwood (A. R.). A Contribution to the Palæontology of the North Derbyshire and Notts Coalfield, or the Southern Part of the North Midland Coalfield. P. 1. (Rep. Brit. Assoc. 1907.) 8vo. *London*, 1908.

—— Notes on the Palæontology of the Leicestershire and S. Derbyshire Coalfield. Pp. 8. 12mo. *Leicester*, 1907. **Author.**

—— The Educational Value of Museum Exhibits compared with their Systematic Arrangement. Pp. 9, with 3 illustrations. (Museumsk. v. Heft 4.) 4to. *Berlin*, 1909.

—— Variation in Birds' Eggs. Pp. 16, with 2 illustr. (Selborne Mag. xx.) 8vo. *London*, 1909.

—— The Cryptogamic Flora of Leicestershire. Pp. 70, with 2 plates. (Trans. Leicester Lit. & Phil. Soc. xiii. part 1.) 8vo. *Leicester*, 1909.

—— The Origin of the British Trias. Pp. 2. (Rep. Brit. Assoc. 1910.) 8vo. *London*, 1911.

—— The Extinction of Cryptogamic Plants. Pp. 31, with 5 plates. (Trans. South-eastern Union of Sci. Soc. 1910.) 8vo. *London*, 1911.

—— Natural Selection and Plant Evolution. Pp. 8. (Journ. Bot. vol. 48.) 8vo. *London*, 1910.

—— Investigation of the Fossil Flora and Fauna of the Midland Coalfields. Pp. 2. 4to. *London*, 1910.

—— Gymnosperms and the Classification of Flowering Plants, some difficulties of Museum Arrangement. Pp. 6. (Museumsk. iv. Heft 4.) 4to. *Berlin*, 1908.

Hose (*Right Rev.* **George Frederick**). *See* **Ridley (Harry Nicholas).**

Howard (Albert) and **Howard (Gabrielle L. C.).** Wheat in India, its Production, Varieties and Improvement. Pp. viii, 288; with 7 plates, 4 illustr. in the text, and 7 maps. 4to. *Calcutta*, 1909. **Authors.**

Howard (Gabrielle Louise Caroline). *See* **Howard (Albert).** Wheat in India. 4to. 1909.

Hurst (Charles Chamberlain). On the Inheritance of Coat Colour in Horses. Pp. 7. (Proc. Roy. Soc. B. vol. 77.) Roy. 8vo. *London*, 1906.

—— On the Inheritance of Eye-colour in Man. Pp. 12. (Proc. Roy. Soc. B. vol. 80.) Roy. 8vo. *London*, 1908.

—— Mendel's Law of Heredity and its application to Man. Pp. 14. (Trans. Leicester Lit. & Phil. Soc. xii. part 1.) 8vo. *Leicester*, 1908.

—— Mendel's Law of Heredity and its application to Horticulture. Pp. 31, with 23 illustrations. (Journ. Roy. Hort. Soc. vol. 36, part 1.) 8vo. *London*, 1910.

—— Mendelism and Sex. An Address delivered to the Mendel Society, 29th March, 1909. Pp. 34. 8vo. *London*, 1910. **Author.**

Indian Forest Memoirs. Chemistry Series. Vol. I. parts 1, 2. 4to. *Calcutta*, 1908–1909.

Jackson (Albert Bruce). Catalogue of Hardy Trees and Shrubs growing in the Grounds of Syon House, Brentford. Pp. ix, 38. 8vo. *London*, 1910. **Author.**

Jacquot (A.). Incendies en Forêt. (Forest Fires.) Translated by C. E. C. Fischer. Pp. xv, 278. 8vo. *Calcutta*, 1910.

Jeannel (R.). Révision des Bathysciinæ (Coléoptères Silphides). Morphologie, Distribution géographique, Systématique. Pp. 641; planches 24. (Arch. Zool. Expér. &c. 5 sér. vii. no. 1.) 8vo. *Paris*, 1911.

Johnson (Norman Miller). A Method of Mapping the Distribution of Marine Algæ. Pp. 2. (Scottish Geogr. Mag., Nov. 1910.) 8vo. *Edinburgh*, 1910. **Author.**

Jongmans (W. J.). Die Palæobotanische Literatur, Bibliographische Uebersicht über die Arbeiten aus dem Gebiete der Palæobotanik. Herausgegeben von W. J. Jongmans. Band I. 8vo. *Jena*, 1910.

Journal of Botany. Vol. 48. 8vo. *London*, 1910. **Jas. Britten.**

Judd (John Wesley). The Coming of Evolution. Pp. 171, with 4 portraits. (Cambridge Man. Science and Liter.) 8vo. *Cambridge*, 1910. **Author.**

Kennard (Alfred Santer) and Woodward (Bernard Barham). Notes on Non-Marine Mollusca from some Irish Lakes, obtained by Major H. Trevelyan. Pp. 7. (Irish Nat. xx.) 8vo. *Dublin*, 1911. **B. B. Woodward.**

Kershaw (E. M.). A Fossil Solenostelic Fern. Pp. 9, with 1 plate. (Ann. Bot. xxiv.) 8vo. *Oxford*, 1910. **Author.**

Kirchner (Oskar von). Blumen und Insekten ihre Anpassungen aneinander und ihre gegenseitige Abhängigkeit. Pp. iv, 436; mit 2 Tafeln und 159 Abbildungen im text. 8vo. *Leipzig, Berlin*, 1911.

Kleinschrod (Franz). The Inherent Law of Life, a new Theory of Life and of Disease. Translated from the German and edited by Louise C. Appel. Pp. vi, 214. 8vo. *London*, 1910. **Louise C. Appel.**

Klimaveränderungen (Die) in Deutschland seit der letzten Eiszeit. Herausgegeben und den Teilnehmern am 11. Internationalen Geologischen Kongress in Stockholm (August 1910) gewidmet von der Deutschen Geologischen Gesellschaft. Pp. 98, fig. 1. (Zeitsch. Deutsch. Geol. Ges. Bd. 62, Heft 2, pp. 97–304.) 8vo. *Berlin*, 1910. **H. W. Monckton.**

Kränzlin (Fritz). *See* **Engler (H. G. A.).** Das Pflanzenreich. Heft 45. Orchidaceæ—Monandræ—Dendrobiinæ. 1910.

Krauss (Hermann August) (Tübingen). Monographie der Embien. Pp. 78; mit 5 Tafeln and 7 Textfiguren. (Bibl. Zool. xxiii. Heft 60.) 4to. *Stuttgart*, 1911.

Küster (E.). Allgemeiner Teil. *See* **Bibl. Zoologica**, Bd. xxiv. Heft 61. 4to. *Stuttgart*, 1911.

Kutorga (Stepan Semenovich). Naturgeschichte der Infusionsthiere vorzüglich nach Ehrenberg's Beobachtungen. Text, pp. viii, 143. 8vo. *Carlsruhe*, 1841.
Atlas, pp. 18; Tafeln 7. 4to. *Carlsruhe*, 1841.

Kynoch (James). Wild Flowers at Barmouth and Neighbourhood. Fourth Edition and List by the late Rev. Thomas Salwey. Pp. 49. 8vo. *Brighton*, 1910. **Author.**

Lagerberg (Torsten). Studien über die Entwicklungsgeschichte und systematische Stellung von *Adoxa Moschatellina*, L. Akademische Abhandlung. Pp. 86; mit 3 Tafeln. (Kgl. Sv. Vet. Handlingar, Bd. 44, no. 4.)
4to. *Uppsala & Stockholm*, 1909. **Author.**

Lankester (*Sir* Edwin Ray). Monograph of the Okapi. *See* **British Museum (Natural History)**—Mammals. 4to. 1910.

Laurent (Émile). Mission E. L. (1903-1904). *See* **Wildeman (Émile de).** Roy. 8vo. 1905–1907.

Laurent (Marcel). *See* **Wildeman (Émile de).** Mission Émile Laurent (1903–1904). Roy. 8vo. 1905–1907.

Lendner (Alfred). Les Mucorinées de la Suisse. Pp. 180; avec 59 figures et 3 planches. (Beitr. z. Krytogramenflora d. Schweiz, Bd. iii. Heft 1.) 8vo. *Bern*, 1908.

Lewis (Francis John). The Plant Remains in the Scottish Peat Mosses. Part IV. Pp. 41, with 5 Plates. (Trans. Roy. Soc. Edinb. vol. 47, part 4.) 4to. *Edinburgh*, 1911. **Author.**

Lindman (Carl Axel Magnus). A Linnean Herbarium in the Natural History Museum in Stockholm. II. Pentandria. Pp. 50. (Arkiv Bot. ix. no. 6.)
8vo. *Uppsala & Stockholm*, 1909. **Author.**

Lloyd Library of Botany, Pharmacy, and Materia Medica.
Bulletin. Reproduction Series, No. 6.
8vo. *Cincinnati*, 1884.
Mycological Notes. Nos. 27, 28, 29.
8vo. *Cincinnati*, 1907–1908.
—— —— Polyporoid issue, No. 1.
8vo. *Cincinnati*, 1908.

Loefgren (Alberto). Notas Botanicas. (Ceará.) Pp. 39; plates 24 and map. 4to. *Rio de Janeiro*, 1910. **Author.**

Lull (Richard S.). *See* **Hatcher (John B.).** The Ceratopsia. (U.S. Geol. Surv. Monogr. 49.) 4to. *Washington*, 1907.

Macfarlane (John Muirhead). *See* **Engler (H. G. A.).** Das Pflanzenreich. Heft 47. Cephalotaceæ. 1911.

Manniche (A. L. V.). The Terrestrial Mammals and Birds of North-East Greenland. Pp. 199; with 7 plates and 23 illustrations of Mammals, and 20 illustrations of Birds. (Meddelelser om Grønland, xlv.) Roy. 8vo. *Copenhagen*, 1910. **Author.**

Marsh (Othniel C.). *See* **Hatcher (John B.).** The Ceratopsia. (U.S. Geol. Surv. Monogr. 49.) 4to. 1907.

Martelli (Ugolino). Enumerazione delle "Pandanaceæ." Pp. 21. (Webbia, iii.) 8vo. *Firenze*, 1910. **Author.**

Maslen (Arthur John). The Structure of *Mesoxylon Sutcliffii* (Scott). Pp. 34, with 4 plates. (Ann. Bot. xxv.) 8vo. *Oxford*, 1911. **Author.**

Massart (Jean). Léo Errera. 1858–1905. Pp. 40 et portrait. 8vo. *Bruxelles*, 1905. *Rev.* **G. Henslow.**

—— Esquisse de la Géographie Botanique de la Belgique. Pp. xi, 332; avec 101 figs. (Recueil Inst. Bot. Léo Errera, Suppl. vii. bis.) 4to. *Bruxelles*, 1910.

—— —— Annexe contenant deux cents seize phototypies simples, deux cents quarante-six phototypies stéréoscopiques, neuf cartes et deux diagrammes. Table alphabétique. Pp. xiii. (Rec. Inst. bot. Léo Errera, Suppl. vii. bis.) 4to. *Bruxelles*, 1910. **Author.**

—— *See* **Frédéricq (Léon).** Notice sur Léo Errera. 8vo. 1908.

Massee (George). Diseases of Cultivated Plants and Trees. Pp. xii, 602; with 171 illustrations. 8vo. *London*, 1910.

Molisch (Hans). Die Eisenbakterien. Pp. vi, 83; mit 3 Tafeln und 12 Textfiguren. 8vo. *Jena*, 1910.

Monckton (Horace Woollaston). Geological Excursion to Swanage, Lulworth Cove, and Bournemouth. Pp. 12, with 3 plates. (Proc. Geol. Assoc. xxi.) 8vo. *London*, 1910. **Author.**

—— *See* **Cambridge County Geographies.** 8vo. 1911.

Moquin-Tandon (Alfred). Histoire Naturelle des Mollusques Terrestres et Fluviatiles de France. 2 vols. 8vo. *Paris*, 1855.

Vol. I. pp. 416. Vol. II. pp. 646; planches 54.

Murray (Gilbert). *See* **Home University Library of Modern Knowledge.** 8vo.

Nalepa (Alfred). Eriophyiden (Gallenmilben). *See* **Bibl. Zoologica**, Bd. xxiv. Heft 61. 4to. *Stuttgart*, 1911.

Nathorst (Alfred Gabriel). Beiträge zur Geologie der Bären-Insel, Spitzbergens und des König-Karl-Landes. Pp. 156; mit 2 Tafeln und 97 Figuren im Text. (Bull. Geol. Inst. Upsala, x.) 8vo. *Uppsala*, 1910, **H. W. Monckton.**

Němec (Bohumil). Das Problem der Befruchtungsvorgänge und andere zytologische Fragen. Pp. 532; mit 119 Abbildungen im Text und 5 lithogr. Tafeln. 8vo. *Berlin*, 1910.

Neumann (L. G.). *See* **Berlin.** Das Tierreich. Liefg. 26. Ixodidæ (Acarina). 8vo. 1911.

Nutting (Charles Cleveland). *See* **Siboga-Expeditie.** The Gorgonacea of the Siboga Expedition. VIII. The Scleraxonia. Livr. 57. Monogr. xiii. b[5]. 4to. 1911.

Ogilvie (Campbell P.). Argentina from a British Point of View, and Notes on Argentine Life. With Photographs and Diagrams. Pp. vi, 277. 8vo. *London*, 1910. **Author.**

Oliver (Daniel). Flora of Tropical Africa. Vols. 1-3. 8vo. *London*, 1868–1877.

[*Continued as*]

Flora of Tropical Africa. By various Botanists. Edited by Sir William T. Thiselton-Dyer. Vol. vi. Sect. i. Part 2. 8vo. *London*, 1910. **Director Roy. Gardens, Kew.**

Osborn (Henry Fairfield). The Age of Mammals in Europe, Asia, and North America. Pp. xvii, 635; with 220 illustr. 8vo. *New York*, 1910.

Osborn (T. G. B.). *Spongospora subterranea* (Wallroth), Johnson. Pp. 15; 1 plate. (Ann. Bot. xxv.) 8vo. *Oxford*, 1911. **Author.**

Pax (Ferdinand). *See* **Engler (H. G. A.).** Das Pflanzenreich.

Heft 42. Euphorbiaceæ—Jatropheæ. 1910.
Heft 44. Euphorbiaceæ—Adrianeæ. 1910.
Heft 47. Euphorbiaceæ—Cluytieæ. 1911.

Pearson (Henry Harold Welch). A National Botanic Garden. Presidential Address. Pp. 18. 8vo. *Cape Town*, 1910. **Author.**

Plankton-Expedition der Humboldt-Stiftung (*continued*)

Bd. II. H. e. Die Chätognathen. Von Rudolf von Ritter-Záhany. Pp. 33; mit 11 Textfiguren. 1911.
Bd. III. L. h. 11. Die Tripleen Radiolarien der Plankton-Expedition. Challengeridæ. Von Dr. A. Borgert. Pp. 417–536; mit 5 Tafeln und 22 Textfiguren. 1911.
Bd. V. a. Das Leben im Ozean nach Zählungen seiner Bewohner. Uebersicht und Resultate der quantitativen Untersuchungen. Von Dr. V. Hensen. Pp. v, 406; mit 77 Textfiguren, 28 Tabellen und 1 Tafel. 1911.

Porter (William S.). *See* **British Association.** Handbooks. Sheffield. 8vo. 1910.

Portier (Paul). Recherches Physiologiques sur les Insectes Aquatiques. Pp. 291; 4 planches et 68 illustr. (Arch. Zool. Expér. et Génér. vol. 48, no. 2.) 8vo. *Paris*, 1911.

Przibram (Hans). Experimental Zoologie. III. Phylogenese inklusive Heredität. Pp. 315; mit 25 Tafeln. 8vo. *Leipzig & Wien*, 1910.

Rao (M. Rama, *Rai Sahib*). Notes on Sandal (Germination and Growth of Sandal Seedlings). Pp. 23, with 10 plates. (Ind. Forest Records, vol. ii. part 3.) 4to. *Calcutta*, 1910. **Author.**

Rees (Bertha). *See* **Ewart (Alfred James).** Contributions to the Flora of Australia. Nos. 14, 15. 8vo. 1910.

Rees (*Sir* J. D.). *See* **Smith (Harold Hamel).** Aigrettes and Birdskins. 4to. 1910.

Reid (Clement) and Reid (*Mrs.* Eleanor Mary). A further Investigation of the Pliocene Flora of Tegelen. Pp. 10. (Versl. K. Akad. Wetensch. Amsterd. 1910, Proc. K. Akad. Wetensch. Amsterd. 1910.) 4to. *Amsterdam*, 1910. **Author.**

Reid (*Mrs.* Eleanor Mary). *See* **Reid (Clement).** A further Investigation of the Pliocene Flora of Tegelen. 4to. 1910.

Renauld (Ferdinand). Essai sur des *Leucoloma* et Supplément au Prodrome de la Flore Bryologique de Madagascar, des Mascareignes et des Comores. Pp. ix, 139; planches 24. 4to. *Monaco*, 1909.

Rendle (Alfred Barton). Flora of Jamaica, &c. *See* **British Museum (Natural History)**—Plants. 8vo. 1910.

Retzius (Gustaf). Biologische Untersuchungen. Neue Folge, xv. Pp. iv, 95; mit 21 Tafeln. fol. *Stockholm & Jena*, 1910. **Author.**

Ridewood (Walter George). Monograph of the Okapi. *See* **British Museum (Natural History)**—Mammals. 4to. 1910.

Ridley (Harry Nicholas). A Scientific Expedition to Temengoh, Upper Perak. Pp. 118. (Journ. Straits Branch Roy. As. Soc. no. 57, 1910.) 8vo. *Singapore*, 1910.

—— Right Rev. George Frederick Hose, Bishop of Singapore and Sarawak, 1881–1908. Pp. 4, with portrait. (Journ. Straits Branch Roy. As. Soc. no. 57, 1910.) 8vo. *Singapore*, 1910. **Author.**

Rignano (Eugenio). Ueber die Vererbung erworbener Eigenschaften. Hypothese einer Zentroepigenese. Pp. 399; mit 2 Textfiguren. 8vo. *Leipzig*, 1907. **Author.**

Ritter-Záhony (Rudolf von). *See* **Berlin.** Das Tierreich. Liefg. 29. Vermes—Chætognathi. 8vo. 1911.

—— *See* **Plankton-Expedition der Humboldt-Stiftung.** Bd. ii. H. e. Pp. 33; mit 11 Textfiguren. 4to. 1911.

Riverius (Lazarus), Culpeper (Nicholas), and Cole (Abdiah). The Practice of Physick, wherein is plainly set forth, the Nature, Cause, Differences, and several Sorts of Signs: together with the Cure of all Diseases in the Body of Man. With many Additions in several places never Printed before. In twenty and four Books. fol. *London*, 1661. **R. J. Harvey Gibson.**

Roberts (Emmanuel). "*Tinospora cordifolia*." Pp. 3, with 1 plate. (Journ. Ceylon Branch Brit. Med. Assoc. i.) 8vo. *Colombo*, 1904.

—— "*Gugul*." Pp. 3. (Journ. Ceylon Branch Brit. Med. Assoc. ii.) 8vo. *Colombo*, 1905.

—— "*Asparagus falcatus*." Pp. 2, with 1 col. plate. (Journ. Ceylon Branch Brit. Med. Assoc. ii.) 8vo. *Colombo*, 1905.

—— "*Cyperus rotundus*." Pp. 4, with 1 col. plate. (Journ. Ceylon Branch Brit. Med. Assoc. iii.) 8vo. 1906.

—— "*Plectranthus zeylanicus*." Pp. 2, with 1 plate. (Journ. Ceylon Branch Brit. Med. Assoc. iii.) 8vo. *Colombo*, 1906.

—— "*Terminalia Chebula*." Pp. 4, with 1 plate. (Journ. Ceylon Branch Brit. Med. Assoc. iii.) 8vo. *Colombo*, 1906.

—— "*Smilax ovalifolia*." Pp. 2. (Journ. Ceylon Branch Brit. Med. Assoc. iii.) 8vo. *Colombo*, 1906. **Author.**

Roman (A.). Ichneumoniden aus dem Sarekgebirge. Inaugural-Dissertation. Pp. 175; mit 4 Tafeln und 57 Illustrationen im Text. (Naturw. Unters. des Sarekgebirges in Schwedisch-Lappland, Bd. iv. Zool.) 4to. *Stockholm*, 1909. **Author.**

Rübsaamen (Ewald H.). Die Zoocecidien, durch Tiere erzeugte Pflanzengallen Deutschlands und ihre Bewohner. *See* **Bibl. Zoologica**, Band xxiv. Heft 61. 4to. *Stuttgart*, 1911.

Salwey (*Rev.* Thomas). *See* **Kynoch (James).** Wild Flowers of Barmouth and Neighbourhood. 8vo. 1910.

Saxton (Walter Theodore). Contributions to the Life-History of *Callitris*. Pp. 13, with 2 plates. (Ann. Bot. xxiv.) 8vo. *Oxford*, 1910.

—— The Ovule of the Bruniaceæ. Pp. 5, with 8 figs. (Trans. Roy. Soc. S. Africa, vol. ii. part 1.) 8vo. *Cape Town*, 1910. **Author.**

Schaeberle (J. M.). Geological Climates. Pp. 2. (Science, N. S. xxvii.) 4to. *New Haven*, 1908.

—— An Explanation of the Cause of the Eastward Circulation of our Atmosphere. Pp. 2. (Science, N. S., xxviii.) 8vo. *New Haven*, 1908. **Author.**

Schellenberg (Hans Conrad). Die Brandpilze der Schweiz. Pp. xlv, 180; mit 79 Textfiguren. (Beitr. z. Kryptogamenflora d. Schweiz, Bd. iii. Heft 2.) 8vo. *Bern*, 1911.

Schlich (*Sir* William). Schlich's Manual of Forestry. Vol. III. Forest Management. Fourth Edition, revised. Pp. x, 403, with 59 illustrations. 8vo. *London*, 1911. **Author.**

Scott (Dukinfield Henry). The Evolution of Plants. (Home Univ. Library of Modern Knowledge.) Pp. 256, with 25 illustrations. 8vo. *London*, [1911]. **Author.**

Seward (Albert Charles). *See* **Cambridge Manuals of Science and Literature.** 8vo.

Siboga-Expeditie. Livr. 51–56. 4to. *Leiden*, 1910–1911. *Dr.* **Max Weber.**

Simmons (Herman Georg). Floran och Vegetationen i Kiruna. Pp. 403; plates 22 and map. 4to. *Stockholm*, 1910.

—— Om hemerofila växter. Pp. 19. (Bot. Notiser, 1910.) 8vo. *Lund*, 1910. **Author.**

Smith (Annie Lorrain). A Monograph of the British Lichens, a Descriptive Catalogue of the Species in the Department of Botany, British Museum. Part II. Pp. v, 409; with 59 plates. 8vo. *London*, 1911.

—— *See also* **Brit. Mus. (Nat. Hist.)**—Plants.

Smith (Harold Hamel). Aigrettes and Birdskins; the Truth about their Collection and Export. With a Foreword by Sir J. D. Rees. Pp. 138, with portrait. 4to. *London*, 1910. **Author.**

Smith (Henry G.). *See* **Baker (Richard Thomas).** A Research on the Pines of Australia. 4to. 1910.

Stebbing (T. R. R.). Obituary of Edward Saunders and George Sharp Saunders. Pp. 5. (Proc. Linn. Soc. Lond., Session 122.) 8vo. *London*, 1910. **Author.**

Sterzi (Giuseppi). Il Sistema Nervoso Centrale dei Vertebrati. Vols. I., II. 8vo. *Padova*, 1907–1909.

I. pp. viii, 731; illustr. 194.
Pesci. II. pp. xi, 986; illustr. 385.

Steuer (Adolf). Planktonkunde. Pp. xv, 723; mit 365 Abbildungen im Text und 1 Tafel. 8vo. *Leipzig & Berlin*, 1910.

Stevens (Frank Lincoln) and **Hall (John G.).** Diseases of Economic Plants. Pp. x, 513; with 2 portraits and 214 illustrations. 8vo. *New York*, 1910.

Stopes (Marie Charlotte Carmichael). Adventitious Budding and Branching in *Cycas*. Pp. 8, with 6 illustrations. (New Phytol. ix.) 8vo. *Cambridge*, 1910.

—— Further Observations on the Fossil Flower, *Cretovarium*. Pp. 3, with 2 plates. (Ann. Bot. xxiv.) 8vo. *Oxford*, 1910. **Author.**

Stur (Dionys). Beiträge zur Kenntniss der Flora der Vorwält.

Band I. Die Culm-Flora. Pp. xxii, iv, 366; mit 44 lithographisten Tafeln, 63 Holzschnitten und Zinkographien und 3 Tafeln in Farbendruch. (Abh. k.-k. Geol. Reichsanst. Wien, viii.) 1875–77.

Band II. Die Carbon-Flora der Schatzlarer Schichten. Abt. I. Die Farne der Carbon-Flora der Schatzlarer Schichten. Pp. 418; mit 49 Doppeltafeln und 48 Zinkotypien. (Abh. k.-k. Geol. Reichsanst. Wien, xi. Abt. 1.) 1885.

Die Carbon-Flora der Schatzlarer Schichten. Abt. II. Die Calmarien der Carbon-Flora der Schatzlarer Schichten. Pp. 240; mit 26 Doppeltafeln und 43 Zinkotypien. (Abh. k.-k. Geol. Reichsanst. Wien, xi. Abt. 2.) 1887.

fol. *Wien*, 1875–1887.

Suzuki (Y.). On the Structure and Affinities of Two new Conifers and a New Fungus from the Upper Cretaceous of Hokkaidō (Yezo). Pp. 16; with 1 plate and 3 illustrations in the text. (Bot. Mag., Tokyo, xxiv. n. 284.) 8vo. *Tokyo*, 1910. **Author.**

Szymański (Franz). Ueber einige parasitische Algen. Inaugural-Dissertation. Pp. 23. 8vo. *Namslau*, 1878.

Tepper (J. Gottlieb Otto). South Australian Museum. The Museum Entomologist's Quarterly Reports. With Notes and Remarks on Habits, Remedies, &c., from April 1897 to December 1910. Part I. Nos. 1–35; II. Nos. 36–53. [Published by "The Register" mostly. With 50 Reprints as Leaflets usually by order of the Board of Governors, Public Library and Art Gallery.] 4to. *Adelaide*, 1897–1910. **Author.**

Thomas (Friedrich August Wilhelm). Verzeichnis der Schriften über deutsche Zoocecidien und Cecidozoen bis einschliesslich 1906. *See* **Bibl. Zoologica,** Bd. xxiv. Heft 61.
4to. *Stuttgart,* 1911.

Thomson (John Arthur). *See* **Home University Library of Modern Knowledge.** 8vo.

Tongue (*Miss* Helen). Bushman Paintings. With a Preface by Henry Balfour. Pp. 47; with 54 plates and map.
4to. *Oxford,* 1909. *Dr.* **D. Oliver.**

United States Geological Survey.
[*Continued.*]
Monographs:
Vol. 49. The Ceratopsia. By John B. Hatcher, based on preliminary Studies by Othniel C. Marsh. Edited and completed by Richard S. Lull. Pp. xxx, 300; with 51 plates and 125 illustrations in the text.
4to. *Washington,* 1907.
Vol. 50. The Cretaceous Flora of Southern New York and New England. By Arthur Hollick. Pp. 219; with 40 plates. 4to. *Washington,* 1906.

van Wijk. *See* **Gerth van Wijk.**

Wangerin (Walther). *See* **Engler (H. G. A.).** Das Pflanzenreich. Heft 41. Garryaceæ, Nyssaceæ, Alangiaceæ, Cornaceæ. 1910.

Ward (Harry Marshall). Trees: a Handbook of Forest Botany for the Woodlands and the Laboratory. 5 vols. (Camb. Biol. Series.) 8vo. *Cambridge,* 1904–1909.

Watson (Arnold T.). *See* **British Association.** Handbooks. Sheffield. 8vo. 1910.

Weberbauer (August). Die Pflanzenwelt der peruanischen Anden. Pp. xii, 355; mit 40 Vollbildern, 63 Textfiguren und 2 Karten. (Engler-Drude, Vegetation der Erde, xii.)
8vo. *Leipzig,* 1911.

Wehmer (Karl). Die Pflanzenstoffe, botanisch-systematisch bearbeitet; chemische Bestandteile und Zusammensetzung der einzelnen Pflanzenarten Rohstoffe und Produkte. Phanerogamen. Pp. xvi, 937. 8vo. *Jena,* 1911.

Weiss (Frederick Ernest). Note on the Variability in the Colour of the Flowers of a *Tropæolum* Hybrid. Pp. 6, with 1 plate. (Mem. & Proc. Manch. Lit. & Phil. Soc. vol. 54.)
8vo. *Manchester,* 1910. **Author.**

Wellington, New Zealand.
Department of Lands.
Report on a Botanical Examination of the Higher Waimarino District. By E. Phillips Turner. Pp. 14; figs. 18 and map. fol. *Wellington,* 1909.

Wellington, New Zealand.
Department of Lands (*con.*).
Report on the Sand Dunes of New Zealand. By L. Cockayne. Pp. 30; figs. 35. fol. *Wellington*, 1909.
Report on a Botanical Survey of Stewart Island. By L. Cockayne. Pp. 68; figs. 43 and map. fol. *Wellington*, 1909.

Werner (Franz). *See* **Berlin.** Das Tierreich. Liefg. 27. Reptilia—Chamæleontidæ. 8vo. 1911.

West (George Stephen). On Variation in the Desmidieæ, and its Bearings on their Classification. Pp. 52; with 4 plates, and 4 cuts in the text. (Journ. Linn. Soc., Bot. xxxiv.) 8vo. *London*, 1899.

—— The Alga-Flora of Cambridgeshire, being an Account of the Freshwater Algæ of the County, with Notes on their Classification and Distribution, with Critical Remarks on many of the Species and Descriptions of new ones. Pp. 47, with 3 plates. (Journ. Bot. xxxvii.) 8vo. *London*, 1899.

—— Report on the Freshwater Algæ, including Phytoplankton, of the Third Tanganyika Expedition conducted by Dr. A. W. Cunnington, 1904–1905. Pp. 117, with 9 plates. (Journ. Linn. Soc., Bot. xxxviii.) 4to. *London*, 1907.

—— Some Critical Green Algæ. Pp. 11, with 2 plates. (Journ. Linn. Soc., Bot. xxxviii.) 4to. *London*, 1908.

—— Botanical Synonyms in the Desmidiaceæ and Protococcoideæ. Pp. 5. (Journ. Bot. xlvii.) 8vo. *London*, 1909.

—— The "Red Snow" Plant (*Sphærella nivalis*). Pp. 3. (Journ. Roy. Microsc. Soc. 1909, pp. 28–30.) 8vo. *London*, 1909.

—— The Algæ of the Yan Yean Reservoir, Victoria: a Biological and Œcological Study. Pp. 88; with 6 plates, and 10 cuts in the text. (Journ. Linn. Soc., Bot. xxxix.) 4to. *London*, 1909.

—— A Biological Investigation of the Peridinieæ of Sutton Park, Warwickshire. Pp. 16, with 7 cuts in the text. (New Phytol. viii. nos. 5 & 6.) 8vo. *Cambridge*, 1909.

—— The Algæ of the Birket Qarun, Egypt. Pp. 10, with 1 plate. (Journ. Bot. xlvii.) 8vo. *London*, 1909.

—— Some new African Species of *Volvox*. Pp. 6, with plate. (Journ. Quekett Microsc. Club, 2 ser. xi.) 8vo. *London*, 1910.

—— Algological Notes. Pp. 8, with 3 cuts. (Journ. Bot. xlix.) 8vo. *London*, 1911. **Author.**

West (G. S.) and Griffiths (B. M.). *Hillhousia mirabilis*, a Giant Sulphur Bacterium. Pp. 8, with 1 plate. (Proc. Roy. Soc. B. vol. 81.) 4to. *London*, 1909. **G. S. West.**

West (William) and West (George Stephen). Notes on Freshwater Algæ. I., II., III. Pp. 36. (Journ. Bot. vols. 36, 38, 41.) 8vo. *London*, 1898–1903.

West (William) and West (George Stephen). A further Contribution to the Freshwater Plankton of the Scottish Lochs. Pp. 42, with 7 plates. (Trans. Roy. Soc. Edinb. xli.) 4to. *Edinburgh*, 1905.

—— —— A Comparative Study of the Plankton of some Irish Lakes. Pp. 40, with 6 plates. (Trans. Roy. Irish Acad. B. xxxiii. part 2.) 4to. *Dublin*, 1906.

—— —— Freshwater Algæ from Burma, including a few from Bengal and Madras. Pp. 88, with 7 plates. (Ann. Roy. Bot. Garden, Calcutta, vi. part 2.) fol. *Calcutta*, 1907.

—— —— The Phytoplankton of the English Lake District. Pp. 47, with 3 plates, and 8 cuts in text. (Naturalist, Aug., Sept., 1909.) 8vo. *London*, 1909.

—— —— The British Freshwater Phytoplankton, with Special Reference to Desmid-plankton and the Distribution of British Desmids. Pp. 42, with 6 figs. (Proc. Roy. Soc. B. vol. 81.) 4to. *London*, 1909.

—— —— The Ecology of the Upper Driva Valley in the Dovrefjeld. Pp. 22, with 2 plates and 7 cuts. (New Phytol. ix. no. 10.) 8vo. *Cambridge*, 1910. **Authors.**

Wildeman (Émile de). Mission Émile Laurent (1903–1904). Énumération des plantes récoltées par Émile Laurent avec la collaboration de Marcel Laurent pendant sa dernière Mission au Congo; par É. de W.

2 vols. Roy. 8vo. *Bruxelles*, 1905–1907.

I. pp. ccxxv, 617; figs. 138.
II. plates 184.

Willey (Arthur). Convergence in Evolution. Pp. xii, 177, with 12 illustrations. 8vo. *London*, 1911. **Author.**

Wolff (Hermann). *See* **Engler (H. G. A.).** Das Pflanzenreich. Heft 43. Umbelliferæ—Apioideæ—*Bupleurum*, *Trinia* et reliquæ Ammineæ heteroclitæ. 1910.

Wood (Bertha). *See* **Ewart (Alfred James).** Contributions to the Flora of Australia. Nos. 14, 15. 8vo. 1910.

Wood (John Medley). Natal Plants. Vol. vi. part 2. 4to. *Durban*, 1910. **Author.**

Woodward (Bernard Barham). Note on the Occurrence of *Pisidium personatum*, Malm, in the British Islands. P. 1. (Proc. Malacol. Soc. viii. part 3.) 8vo. *London*, 1908.

—— On the Occurrence of *Pisidum supinvm* in the Living State in England. P. 1. (Proc. Malacol. Soc. viii. part 6.) 8vo. *London*, 1909.

—— On the Occurrence in the British Isles of Living Specimens of *Pisidiu n Steenbuchii*, Mörch, and *P. Lilljeborgii*, Clessin, with Notes of New Records of *Pisidia* for the Lake District, and Fresh Localities for *P. supinum*, A. Schm. Pp. 2. (Proc. Malacol. Soc. ix. part 1.) 8vo. *London*, 1910.

—— Note on further British Localities for *Pisidium Steenbuchii*, Möller, and *P. Lilljeborgii*, Clessin. P. 1. (Proc. Malacol. Soc. ix. part 3.) 8vo. *London*, 1910.

Woodward (Bernard Barham). *See* **British Museum (Natural History)**—Catalogue of Books, &c. 4to. 1903–1910.

—— —— *See* **Kennard (A. S.).** Notes on Non-Marine Mollusca from some Irish Lakes, obtained by Major H. Trevelyan. 8vo. 1911.

Ziegler (Heinrich Ernst). Der Begriff des Instinktes einst und jetzt . . . Mit einem Anhang: Die Gehirne der Bienen und Ameisen. Pp. vi, 112; mit 2 Tafeln und 16 Abbildungen im Text. 8vo. *Jena*, 1910.

Zoological Record. Vol. 46. (1909.) 8vo. *London*, 1910.

Zürich.

Botanische Museum der Universität Zürich. Mitteilungen. No. 36. 8vo. *Zürich*, 1907→

—— Der botanische Garten und das botanische Museum der Universität, Zürich, im Jahre 1909. 8vo. *Zürich*, 1910. *Dr.* **Hans Schinz.**

DONATIONS.

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Subscription portrait of John Joseph Bennett, by E. U. Eddis.

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1898.

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1899.

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1901.

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Executors of the late G. B. Buckton, Esq.: Contribution for colouring plates of his paper, £26.

1906.

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1907.

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Royal Society: Third and final grant towards 'Biscayan Plankton,' £50.

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1908.

Prof. Gustaf Retzius: Plaster cast of bust of Carl von Linné, modelled by Walther Runeberg from the portrait by Scheffel (1739) at Linnés Hammarby; the bronze original is for the façade of the new building for the Royal Academy of Science, Stockholm.

Miss Sarah Marianne Silver, F.L.S.: Cabinet formerly belonging to Mr. S. W. Silver, F.L.S.

1909.

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1910.

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1911.

The Trustees of the Percy Sladen Memorial Fund: Donation towards the publication of the third volume on the Indian Ocean Researches, £70.

The following Councillors retired at the Anniversary Meeting, 24th May, 1911 :—

E. A. Newell Arber, M.A., Prof. J. Bretland Farmer, Dr. G. Herbert Fowler, Prof. J. P. Hill, and John Hopkinson, F.G.S.

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de Fraine, Dr. E., *see* Moss, Dr. C. E.
de Gaye, J. A., admitted, 11; elected, 3; proposed, 1.
Dendy, Prof. A., communication from Prof. Herdman, 9; elected Auditor, 11; elected Councillor and Secretary, 16; showed lantern-slides, and a specimen, of New Zealand sponges, 7.
—— and G. E. Nicholls, On the Sub-Commissural Organ and Reissner's Fibre, 5.
Dermaptera (Earwigs) preserved in Amber (Burr), 9.
Deverell, L. C., withdrawn, 13.
Digitaria didactyla, Willd., exhibited (Stapf), 6.
Donations in aid of Publications, 96; — to Library, 71; — to the Society (1790–1911), 97.
Drake-Brockman, R. E., proposed, 7; elected, 9.
Driesch, Dr. H., elected Foreign Member, 12; proposed, 8.
Druce, G. C., exhibited *Utricularia ochroleuca*, *U. Bremii*, *Arabis alpina*, and *Chærophyllum aureum*, 3.
Druce, H., elected Auditor, 11.
Dunn, S. T., Chinese Flowering-Plants, 7; exhibited bamboo-rope from Central Fokien, 7; — lantern-slides of photographs of Central Fokien, 7; Revision of the Genus *Actinidia*, 7.
Dykes, W. R., showed autochrome photographs of certain species of *Iris*, 7.

Earwigs, *see* Dermaptera.
Ecology of a Cambs. woodland (Adamson), 10.
Elections, number of, 13.
Enhalus acoroides, Rich., Anatomy of, (Cunnington), 47.
Enock, F., showed lantern-slides of *Mymar*, 47.
Euphausiacea, *see* Nysidacea.
Eyles, F., proposed, 11; elected 45.

Falkland Islands, Flora of the (Wright), 5.
Farmer, Prof. J. B., Councillor retired, 105.

Fauna of the Carboniferous Period (Woodward), 45.
Fawcett, W., showed *Scybalium jamaicense*, Schott & Endl., and *Musa paradisiaca* var. *sapientum*, 47.
Fellows deceased, 12; elected, 13; withdrawn, 13.
Ferns, Chinese (Matthew), 7,
Financial Statement, *see* Cash Statement.
Flora of the Falkland Islands (Wright), 5.
Flowering-plants, Chinese (Dunn), 7.
Foreign Members deceased, and elected, 13.
Fossorial Hymenoptera of the Indian Ocean (Turner), 6.
Fowler, Dr. G. H., communication by (Bigelow), 2; Councillor retired, 105.
Fowler, Canon W. W., communication by (Imms), 47.
Fox, A. R., deceased, 12; obituary, 37.
Foxglove, Monstrosities in the, exhibited (Crisp, Stebbing), 48.
Friend, Rev. H., elected, 45; proposed, 11.
Fritsch, Dr. F. E., Freshwater Algæ from the South Orkneys, 12.
Fryer, J. C. F., Aldabra and neighbouring Islands, 2; Lepidoptera of the Seychelles, 47.
Fullerton, M. B., admitted, 11; elected, 9; proposed, 7.

Galton, the late Sir Francis, mentioned, 5.
Gardiner, Prof. J. S., communications by: (Fryer), 2; (Hickson), 12; (Hirst and others), 8; (Kieffer and others), 47; (Tattersall, Thornely), 9; (Turner and others), 6; elected Councillor, 16.
General Secretary, Annual Report of, 12; election of (Dr. B. D. Jackson), 16.
Gepp, A., Report on the Inter. Congr. of Bot., 1911, 52.
Gerrard, E., deceased, 2, 13; obituary, 37.
Goodall, T. B., elected, 3; proposed, 1.
Goodrich, E. S., elected Councillor, 16.
Griffithsia globifera, J. Ag., exhibited (Holmes), 8.
Groom, Prof. P., communication by (Cunnington), 47.
Groves, H., elected Auditor, 11; — Councillor, 16; Report of, on the Inter. Congr. of Bot., 1911, 52.
Halket, Miss A. C., admitted, 46; elected, 45; proposed, 11.
Harmer, S. F., on the terms Polyzoa and Bryozoa, 70.
Harpactid Copepoda, Three species of (Norman), 7.
Hart, J. H., deceased, 12; obituary, 39.
Hayward, Miss I. M., admitted, 3; on alien plants from banks of River Tweed, 3, 48–51.
Henderson, Dr. G., showed lantern-slide of the head of a Waterbuck, 47.
Henslow, Prof. G., Origin of Monocotyledons, 3; Origin of *Plantago maritima* and *P. alpina*, 3.
Herdman, Prof. W. A., *Amphidinium operculatum*, Clap. & Lachm., at Port Erin, 45, 47; elected Councillor, 16; On the use of the term Polyzoa, 9; On J. V. Thompson's use of the term "Polyzoa," 62; Summer Plankton in the Irish Sea, 2.
Hertwig, Prof. R. von, proposed as, and elected, Foreign Member, 8, 12.
Hexactiniæ from New South Wales (Wilsmore), 7.
Hickson, Prof. S. J., *Polytrema* and some allied genera, 12.
Hill, A. W., elected Councillor, 16.
Hill, Prof. J. P., communication by (Wilsmore), 7; Councillor retired, 105.
Hind, *see* Archer-Hind.
Hindle, Dr. E., admitted, 9; elected, 2.
Hirst, A. S., Aranæ, Opiliones, and Pseudoscorpiones from the Seychelles, 8.
Holden, H. S., admitted, 4.
Holland, Rev. M., admitted, 5; elected, 4; proposed, 2.
Holmes, E. M., exhibited *Griffithsia globifera*, J. Ag., 8.
Hooker, Sir Joseph, letter of congratulation to, 46.
Hopkinson, J., Councillor retired, 105; showed lantern-slides of photographs of, and exhibited specimens of rock from, Sweden, 9.
Hovenden, F., deceased, 12; obituary, 39.
Hudson, F. C., elected, 3; proposed, 1.
Hymenoptera, Fossorial, of the Indian Ocean (Turner), 6.

Imms, Prof. A. D., Life-history of *Crocc filipennis*, Westw., 47.
Indian Ocean, Fossorial Hymenoptera of the (Turner), 6; Marine Brachyura from the (Rathbun), 8; Marine

Polyzoa from the (Thornely), 9; Nysidacea and Euphausiacea from the (Tattersall), 9.
International Congress of Botany Reports: (Stapf), 4, 51, 55; (Groves & Gepp), 52; (Cotton), 54.
Iris, autochrome photographs of certain species of, shown (Dykes), 7.
Irish Sea, *see* Plankton.

Jackson, Dr. B. D., elected Councillor and Secretary, 16; exhibited a monstrous pear, 21; on some portraits of Carl von Linné, 6. 56–61; on the old Botanic Garden at Uppsala, 8.
Jones, W. N., elected, 46; proposed, 12.
Johnson, N. M., admitted, 11; elected, 3; proposed, 1.

Kertész, Dr. K., Stratiomyiidæ of the Seychelles, 6.
Khor Dongonab, Physical description of (Crossland), 6.
Kieffer, J. J., Cecidomyiidæ and Chironomidæ of the Seychelles, 6; Cynipidæ and Proctotrupoidea of the Seychelles, 47.
Klebs, Prof. G., elected Foreign Member, 12; proposed, 8.

Leaves of certain species of *Veronica* (Adamson), 4.
Lee, E., admitted, 46; elected, 45; proposed, 11.
Lepidium neglectum, Thell., and *L. densiflorum*, Schrad., exhibited (Salmon), 8.
Lepidoptera from Toronto exhibited (Corfe), 5; — of the Seychelles (Fryer), 47.
Lewis, E. J., withdrawn, 13.
Librarian's report, 13.
Library Additions, 73–95.
Linné, Carl von, on some portraits of (Gen. Sec.), 6, 56–61.
Linnean Medal presented to Count Solms-Laubach, 30.
Lolium perenne, Linn., mentioned, 6.
Longstaff, Mrs., showed *Brassia caudata*, Lindl., in flower, 48.

Maize with androgynous inflorescences exhibited (Worsdell), 2.
Masterman, A. T., withdrawn, 13.
Matthew, Fleet-Surgeon, Chinese Ferns, 7.
Meade-Waldo, G., Wasps of the Seychelles. 47.
Medal, Linnean, presented to Count Solms-Laubach, 30.
Meek, Capt. C. F. U., Spermatogenesis of *Stenobothrus viridulus*, 3.
Meyrick, E., Tortricina and Tineina of the Seychelles and Aldabra, 6.
Minchin, Prof. E. A., admitted, 5; elected, 1.
Monckton, H. W., appointed V.-P., 45; elected Councillor and Treasurer, 16; showed lantern-slides of photographs of Sweden, 8.
Monocotyledons, Origin of (Henslow), 3.
Moss, Dr. C. E., E. G. Salisbury, and Dr. E. de Fraine, The Genus *Salicornia*, 11.
Moulton, J. C., elected, 45; proposed, 11.
Mundy, H. G., elected, 4; proposed, 2.
Murray, J. G., elected, 45; proposed, 11.
Musa paradisiaca var. *sapientum*, shown (Fawcett), 47.
Myrnar, lantern-slides of, shown (Enock), 47.

Navicula Amphisbæna at Port Erin (Herdman), 47.
Nawaschin, Prof. S. G., proposed as, and elected, Foreign Member, 8, 12.
Nevill, C. St. J., admitted, 3; elected, 2.
New South Wales, *see* Wilsmore, Mrs. L. J.
New Zealand, *see* Dendy, Prof. A.
Nicholls, G. E., *see* Dendy, Prof. A.
Niphargus plateaui, Chevreux, exhibited (Bullen), 5.
Norman, Rev. Canon, Three species of Harpictid Copepoda, 7.
Nysidacea and Euphausiacea from the Indian Ocean (Tattersall), 9.

Obituary Notices, 32–41.
Oliver, Prof. F. W., communication by (Baker), 11; elected Councillor, 16; Vote of thanks seconded by, 29.
Opiliones, *see* Araneæ.
Origin of Monocotyledons (Henslow), 3; — of *Plantago maritima* and *P. alpina* (Henslow), 3.
Orkneys, South, *see* Fritsch, Dr. F. E.

Parsons, Miss E. M. E., admitted, 4; elected, 3; proposed, 1.

Patron, Consent of King George V. to become, 1.
Pear, monstrous, exhibited (Gen. Sec.), 2.
Penard, Dr. E., elected Foreign Member, 12; proposed, 8.
Phoridæ of the Seychelles (Collin), 47.
Physical description of Khor Dongonab (Crossland), 6.
Plankton, Summer, in the Irish Sea (Herdman), 2; *see* Siphonophora.
Plantago maritima and *P. alpina*, Origin of (Henslow), 3.
Polytrema and some allied genera (Hickson), 12.
Polyzoa, Marine, from the Indian Ocean (Thornely), 9.
Polyzoa and Bryozoa, The terms (Stebbing), 9, 12, 61, 64–68; (Harmer), 70; (Herdman), 9, 62; (Waters), 71.
Port Erin, *see* Herdman, Prof. W. A.
Poulton, Prof. E. B., appointed V.-P., 45; elected Councillor, 16.
Powell, Lt.-Col. S., deceased, 12; elected, 3; obituary, 40; proposed, 1.
Prain, Lt.-Col. D., Vote of thanks moved by, 29.
President elected (Dr. D. H. Scott), 16.
Presidential Address, 17–29.
Proctotrupoidea of the Seychelles (Kieffer), 47.
Pseudoscorpiones, *see* Araneæ.

Rathbun, Miss M. J., Marine Brachyura from the Indian Ocean, 8.
Red Sea, *see* Sponges.
Reid, Clement, appointed Scrutineer, 13, 16.
Reissner's Fibre, *see* Dendy, Prof. A.
Rendle, Dr. A. B., appointed V.-P., 45; Councillor, 16; elected Auditor, 11.
Reptiles, *see* Batrachians.
Rhizopods, British, New and little-known (Brown), 12.
Ridewood, Dr. W. G., elected Councillor, 16.
Row, R. W. H., Non-calcareous Sponges from the Red Sea, 4.
Rubus Idæus, Abnormal form of, exhibited (Trail), 2.

Salicornia, The Genus (Moss, Salisbury, and de Fraine), 11.
Salisbury, E. G., *see* Moss, Dr. C. E.
Salmon, C. E., exhibited *Lepidium neglectum*, Thell., and *L. densiflorum*, Schrad., 8.
Salt-Marsh, *see* Seaweeds.
Sanford-Burton, H., deceased, 12.
Saunders, Miss E. R., elected Councillor, 16.
Scott, Dr. D. H., appointed Vice-Presidents, 45; elected Councillor and President, 16; nominated Scrutineers, 13, 16; Presidential Address of, 17–29.
Scott, Mrs. D. H., gave lantern exhibition of new species of *Traquairia*, 10.
Scrutineers appointed, 13, 16.
Scybalium jamaicense, Schott & Endl., shown (Fawcett), 47.
Seaweeds, Brown, of the Salt-Marsh (Baker), 11.
Secretaries elected, 16.
Seychelles; Apoidea (Cockerell), 47; Araneæ, Opiliones, and Pseudoscorpiones from the (Hirst), 8; Batrachians and Reptiles from the, and Aldabra (Boulenger), 8; Borboridæ, 47; Cecidomyiidæ of the (Kieffer), 6; Chironomidæ of the (Kieffer), 6; Culicidæ (Theobold) of the, 47; Cynipidæ and Proctotrupoidea (Kieffer), 47; Lepidoptera (Fryer), 47; Phoridæ (Collin), 47; Stratiomyiidæ of the (Kertész), 6; Tortricina and Tineina of the, and Adabra (Meyrick), 6; Wasps (Meade-Waldo), 47.
Shaw, F. J. F., proposed, 11; elected, 45.
Shelford, R., Blattidæ enclosed in Amber, 12.
Siphonophora of 'Research' Biscayan Plankton (Bigelow), 2.
Smith, E. A., withdrawn, 13.
Soames, H. A., withdrawn, 13.
Soar, C. D., admitted, 11; elected, 9; proposed, 7.
Solms-Laubach, Count Hermann, to receive the Linnean Medal, 11; Linnean Medal presented to, 30; his thanks, 31.
Soper, F. L., deceased, 12; obituary, 40.
Spengel, Prof. J. W., elected Foreign Member, 12; proposed, 8.
Spermatogenesis of *Stenobothrus viridulus* (Meek), 3.
Sponges, Lantern-slides, and a specimen, of New Zealand, shown (Dendy), 7; Non-calcareous, from the Red Sea (Row), 4.
Sporocarpon elegans, exhibited (Scott), 10.
Stapf, Dr. O., elected Councillor and Secretary, 16; exhibited *Digitaria didactyla*, Willd., from Sydney, 6; Report on the Inter. Congr. of Bot., 1911, 4, 51, 55.

Stebbing, Mrs. M. A., exhibited monstrosity in the Foxglove, 48.
Stebbing, Rev. T. R. R., appointed Scrutineer, 13, 16; On J. V. Thompson and his Polyzoa, 12, 64–68; On *Vaunthompsonia*, Bate, 69; The terms Polyzoa and Bryozoa, 9, 61.
Stenobothrus viridulus, Spermatogenesis of (Meek), 3.
Stewart, S. A., deceased, 2, 13; obituary, 40.
Stratiomyiidæ of the Seychelles (Kertész), 6.
Sub-Commissural Organ and Reissner's Fibre (Dendy and Nicholls), 5.
Sweden, Lantern-slides of photographs of, shown (Hopkinson), 9; (Monckton), 8; specimens of rock from, exhibited, 9.
Sydney, *see* Stapf, Dr. O.
Sykes, E. R., withdrawn, 13.

Tansley, A. G., communications by (Adamson), 4, 10.
Tattersall, W. M., Nysidacea and Euphausiacea from the Indian Ocean, 9.
Theobald, F. V., Culicidæ of the Seychelles, 47.
Thomas, Miss E. N., elected Councillor, 16.
Thompson, H. S., elected, 3; proposed, 1.
Thompson, J. V., and his Polyzoa (Stebbing), 12; his use of the term "Polyzoa" (Herdman), 62.
Thornely, Miss L. R., Marine Polyzoa from the Indian Ocean, 9.
Tineina, *see* Tortricina.
Toronto, *see* Corfe, Miss B. O.
Tortricina and Tineina of the Seychelles and Aldabra (Meyrick), 6.
Trail, Prof. J. W. H., exhibited an abnormal form of *Rubus Idæus*, 2.
Traquairia, Lantern exhibition of new species of (Scott), 10.
Treasurer elected (H. W. Monckton), 16.
Treub, Dr. M., deceased, 2, 13; obituary, 41.
Turner, R. E., Fossorial Hymenoptera of the Indian Ocean, 6.
Tweed, River, *see* Hayward, Miss I. M.

Uppsala, Old Botanic Garden at (Gen. Sec.), 8.
Utricularia ochroleuca, Hartm., and *U. Bremii*, Heer, exhibited (Druce), 3.

Vaunthompsonia, Bate (Stebbing), 69.
Veronica, Leaves of certain species of (Adamson), 4.
Vice-Presidents appointed, 45.

Wailes, G. H., admitted, 46; elected, 11; proposed, 8.
Waldo, *see* Meade-Waldo.
Walker, A. O., appointed Scrutineer, 16.
Walker, C. E., withdrawn, 13.
Wasps of the Seychelles (Meade-Waldo), 47.
Waterbuck, Lantern-slide of the head of a, shown (Henderson), 47.
Water-colour drawings of wild flowers, exhibited (Corfe), 4.
Waterfall, C., elected, 45; proposed, 11.
Waters, A. W., On the terms Polyzoa and Bryozoa, 71.
Watson, Rev. R. B., deceased, 12; obituary, 43.
Whitman, C. O., deceased, 13.
Wickes, W. D., deceased, 12.
Wilsmore, Mrs. L. J., Hexactiniæ from New South Wales, 7.
Wilson, Prof. E. B., proposed as, and elected, Foreign Member, 8, 12.
Wilson, M., admitted, 46; elected, 45; proposed, 11.
Withdrawals, 13.
Woodward, Dr. A. S., elected Councillor, 16; On the Fauna of the Carboniferous Period, 45.
Worsdell, W. C., exhibited maize showing androgynous inflorescences, and wood-carving riddled by *Botrychoplites cornutus*, Oliv., 2.
Wright, C. H., Flora of the Falkland Islands, 5.

Zeitz, A. H. C., withdrawn, 13.
Zoological Secretary elected (Prof. A. Dendy), 16.

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List of [Fellows, Associates, and Foreign Members], 1910–1911.